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The Antiseptic

Estd. 1904

A Monthly Journal of Medicine & Surgery

Published on the 15th of every Month

Edited by : Drs. U. RAMA RAU & U. KRISHNA RAU, M.B., B.S.,
Asst. Editor : U. VASUDEVA RAU, M.B., B.S.

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Original Articles

LIVER ABSCESS*

R. SUBRAMANIAM, B.Sc., M.D., M.R.C.P. (Lond.),

Physician, Government Stanley Hospital, Madras.

LIVER abscess is one of the commonest complications of amœbic dysentery. There are two stages in the development of an abscess liver : the hepatitis and the abscess. Hepatitis itself has again two phases : the acute phase and the chronic phase. In the acute stage of the hepatitis, the essential pathology is the liver being invaded by amœba. Roughly this can be compared to para-troop landing in a city. If the defence of the city is alright, the paratroopers are rounded up and nothing more is heard of them. Correspondingly, where the liver cells are healthy, the hepatitis clears without a residual symptom. Whereas in a city, where the defence mechanism is poor, the paratroopers are able to contact each other and establish a colony of their own. This corresponds to a devitalised liver where the defence mechanism is poor, and the amœba is able to bring about colliquative necrosis of the liver cells and form an abscess. Devitalisation of the liver occurs in chronic alcoholics and subjects of protein-deficiency or lowered resistance due to other chronic diseases like a syphilitic infection.

In the acute stage, the condition is curable without operation. In this form the patient has high fever and enlarged tender liver. Usually there is a history of diarrhœa or dysentery sometime ago.

* Address delivered before the Erode Branch of the Indian Medical Association at their Annual Meeting.

The absence of such a history should not be taken too seriously. The temperature chart is that of an irregular remittent type with a relatively fast pulse, and now and then profuse perspiration occurs. Examination shows enlarged tender liver. The enlargement is both upward and downward. X-ray or screening shows well-marked upward enlargement in quite a number of cases as shown by the elevation of the right dome of the diaphragm. While when present, this may be taken as a useful sign, the absence of such a thing does not rule out hepatitis. The left side of the diaphragm is not usually elevated, but may be elevated in case of hepatitis or abscess of the left lobe of the liver.* This is relatively very rare. X-ray also shows involvement of the adjacent lung. The bowels may be thickened, particularly the cæcum and the ascending colon. Usually there is always a well-marked leucocytosis at this stage, the count varying widely anywhere between 10,000 and 30,000 per c.mm. Aspiration at this stage only results in blood being aspirated.

In the chronic hepatitis, the diagnosis is not quite so obvious, as in the acute form. Here the liver is not usually tender. There may be diarrhœa and there is also enlarged liver. On quite a number of occasions, I have been successful in finding active amœba in the motion of these cases. There is also moderate leucocytosis. In this phase, emaciation may be prominent; hence, very often, this condition is diagnosed as tuberculous enteritis. Repeated examination of the motion may be necessary to demonstrate the amœba or the cysts. I have noticed that if the motion is collected after administering a saline purgative, positive results are more often met with. In this condition X-ray and screening are of considerable help.

Treatment at this stage is simple and effective. Emetine 1 gr. intramuscularly daily for six days followed by Iodo-quinoxyline compounds is quite satisfactory and prevents the condition going on to liver abscess. With Emetine administration, in the course of three or four days, fever comes down and with that the leucocytosis also comes down. Occasionally it may take as long as six days. Hence before finishing six grains of Emetine, one should not expect the temperature to run normal.

Suppurative hepatitis or liver abscess.—This is a later stage of the hepatitis. The causative agent is entamœba histolytica. The pus is usually sterile unless secondary infection has occurred. In my opinion, the predisposing factor in abscess liver seems to be an alcoholic habit. In a series of over 50 cases, I have come across only four cases of liver abscess in non-alcoholics. Even at the expense of being considered as exaggerating, I should like to say that I consider liver abscess—case proved by aspirating chocolate-coloured pus—is exceedingly rare in a non-alcoholic. Alcoholic habit seems to devitalise the liver resistance to the amœbic invasion. To arrive at the diagnosis in the out-patient, I depend more on the

history of alcohol addiction rather than on a history of dysentery or diarrhœa. I am quoting three cases just to show the importance of alcoholic habit.

In my first case, liver abscess was diagnosed in an old man. We aspirated him once and put him on Emetine. In spite of that he was sinking. Finding that he was not improving, we asked him as to what he wanted. He wanted a pot of toddy to drink and he was given the same as his general condition was too poor. In a day or two, he died and partial autopsy showed a big liver abscess containing a small amount of pus and the rest of the abdominal viscera healthy. In the second case, a man was admitted with abscess liver. He was aspirated 18 years ago and we aspirated again typical chocolate coloured pus. The liver had shrunk and he was afebrile. At this stage he took leave to attend his daughter's marriage, went out, drank heavily at the wedding and in a week's time he was back in the hospital with the recurrence of symptoms and liver again palpable four fingers breadth below the costal margin. We again aspirated about 10 oz. of pus and warned him not to indulge in alcohol. He was reporting himself once in a way for two or three years when he was found to be maintaining his health. Later he joined the Military in 1942 and by 1945 started to take alcohol and in 1947 reported sick with hepatitis. This time we did not strike any pus and the hepatitis responded to Emetine treatment.

I have come across liver abscess only twice in women. In the second case which occurred in December 1946, when I inquired for alcoholic habit, the woman actually said brandy was very welcome. This woman was aspirated twice and she was a heavy alcohol addict. It is well known that liver abscess is comparatively infrequent in women. Even amœbic dysentery is less common in women than in men. This might be due to the more sheltered life that they lead. But the liver abscess, as a complication in women, is almost a curiosity. I presume it is so because they do not indulge in alcohol. For the same reason, liver abscess is very rare in children. The youngest age recorded is by Biggam, A. G., in 1932, of a case of amœbic dysentery in an Egyptian child three months of age who had also amœbic abscess of the liver. The child died of bronchopneumonia and autopsy showed amœbic ulcers in the bowel.

Pathology of liver abscess.—Entamœba histolytica reach the liver from the dysenteric ulcers in the colon through the portal vein in large numbers. It causes a diffuse inflammation or hepatitis. At this stage, if a needle is put into this enlarged liver, only blood is drawn. If the amœba meets with devitalised liver cells and gets a hold, it multiplies and by a process of coagulative necrosis causes destruction of the liver. This occurs in various centres and these spread and by a confluence lose their individuality and constitute a large abscess. Thus the pus inside is actually liquefied liver and not due to suppurative process as in a

coccal infection. Hence culture of this pus is always sterile unless secondary infection has taken place. The abscesses may fail to coalesce and then we get multiple liver abscesses. The pus when secondarily infected is no longer chocolate coloured, but is greenish or yellowish, depending upon the organism. The commonest secondary organism seems to be B. coli.

The abscess may slowly work its way to the surface and may even rupture into the adjacent portion as into the pleural cavity, pericardial cavity into the peritoneum or rarely into the surface by a sinus. In chronic abscesses, the pus may be well walled off by a wall of connective tissue. In these cases, signs and symptoms are apt to be misleading. If, as a result of treatment, the amœbæ are destroyed, calcification of the abscess wall may take place. In these cases encystment occurs and may be an autopsy discovery. The cavity may contain a clear fluid with very few pus cells. Amœbæ themselves are not usually seen in the liver abscess pus. They are only seen in the scrapings from the wall of the abscess cavity. Cysts are never found in the liver abscess pus.

Liver efficiency tests are likely to show greater deficiency of the liver in the hepatitis stage, and in a chronic abscess liver in which the abscess is well walled off, the liver efficiency may be normal, and leucocyte count may also be normal.

Symptomatology.—There are few diseases with such varied symptomatology. Even the best of clinicians have missed abscess liver and diagnosed one when it was not there. In a typical case, patient complains of pain over the side of the chest, over the liver area, or over the shoulder. The pain is fairly severe, with fever coming on in the evenings. At the onset of the fever, there may be rigor, but there may or may not be further rigors, but occasionally there may be daily rigor. On examination, there is a bulge on the right side of the chest over the liver area and also over the right hypochondrium. The liver is enlarged and tender. The enlarged liver is smooth and not nodular. It may be moderately firm or even very hard. Quite a few cases have even been misdiagnosed as cancer liver because of the hardness of the liver that might occur in some cases. In most of the cases, over the right base of the lung, percussion note is impaired and the breath sounds may be feeble or even absent with fine rales. This may be due to either the upward enlargement of the liver in the right upper quadrant, or associated pneumonitis in the right base, or to pleurisy with or without effusion in the right side. This pleural effusion may be clear, straw-coloured fluid showing that the pleura is being irritated or in some cases the liver abscess may burst into the pleural cavity,—if the lung itself is not adherent to the diaphragm—it may behave like pleural effusion due to any other cause. If, on the other hand, the lung is adherent to the diaphragm, then the patient may cough out liver abscess pus and the liver might suddenly shrink. I can now recall a case.

A wandering Sanyasi was admitted with what appeared like an oval tumour filling up the right hypochondrium, right loin and almost reaching the right iliac fossa. No definite diagnosis could be made. The tumour was found to be moving with respiration and looked as though in continuity with liver dullness. The man gave a history of dysentery some years ago and was an alcoholic. He was complaining of pain and was also running a temperature between 102°F and 103°F. Though we were not certain of the diagnosis, we put the patient on Emetine I.M. daily, and, on the second day, the patient said he was feeling giddy and vomited about a pint of chocolate coloured pus and in the course of the next few hours, the tumour disappeared under our very eyes. He was spitting bile-stained saliva for a few more days and this man made an uneventful recovery.

In a typical case, the abscess may actually point in various parts of the chest or even in the back. In one of my cases, our surgeon even thought it might be abscess of abdominal wall. In another case, the abscess had worked its way into the anterior abdominal wall and presented as a small ball-like structure in the anterior abdominal wall. Only on the table it was realised that it was a case of liver abscess which had worked its way into the rectus sheath. In another case, the abscess had worked its way into the small of the back and was diagnosed as perinephric abscess. This case again was properly diagnosed only by operation. In another case, a man came complaining of pain over the area of the right kidney and intermittent type of temperature. Fever used to be coming on with rigor. There were no positive clinical findings except slight tenderness over the small of the back on the right kidney region and very slight fulness. Urine did not show any change and urine culture was sterile. All the same, he was put on alkaline diuretic mixture for a few days with no benefit. One day the patient complained of a severe pain and said that something had given way deep in his chest and in a few minutes he was in a state of shock with profuse perspiration and fast and feeble pulse. Clinical examination showed signs of pleural effusion right base and a chest picture taken in the next few hours confirmed the diagnosis. In view of the fever and the abrupt onset of effusion, liver abscess bursting into the pleural cavity was thought of, and a needle was put into the pleural cavity and chocolate-coloured pus was aspirated. Patient was immediately started on Emetine therapy with considerable improvement. In this case the liver abscess must have been situated posteriorly and pressed upon the kidney, causing a slight amount of fulness over the loin and simulated pyelitis.

Jaundice does definitely occur in the course of liver abscess. Failure to bear this possibility in mind has been the cause of missing at least quite a number of cases by clinicians. In one of my cases,

a man came with jaundice, enlarged spleen and liver and intermittent type of fever. Jaundice was of the obstructive type. He gave a history of alcoholic habit and also of having had dysentery some years ago. We put him on a course of Emetine and aspirated about 8 ounces of pus and the jaundice promptly cleared. A few days later, he was admitted again with jaundice. He was aspirated again and the jaundice cleared within a day or two. In this case, the jaundice showed unmistakable relationship to the abscess liver. In another case which I happened to see, was in an old man past 55 or even more. This man was toxic and deeply jaundiced with a very big liver which was nodular and very hard to the feel. Primary carcinoma liver was the diagnosis made. At the autopsy, it proved to be a case of liver abscess and the nodularity felt in the wards turned out to be due to the abscess wall bulging through the healthy liver. In this case the age of the man, the nodularity of the liver and the hardness of the liver completely misled every body and, but for the autopsy, this would have been completely missed. So it is worth bearing this factor in mind. An enlarged liver with fever and jaundice means the possibility of a liver abscess. Another of my case, again an old man, was admitted with what looked like a case of congestive heart failure. The patient had œdema of the legs and arms with slight puffiness of the face. He was deeply jaundiced and an abscess pointing in the anterior abdominal wall. It looked as though the abscess would burst any minute. I put him on Emetine and showed him to our surgeon. He was operated on immediately and about a pint of pus was drained. Left to me, I would not have advised operation at that stage, but my surgeon was afraid that the abscess might burst and thus might become an emergency. He had to be aspirated two or three more times before he recovered completely. In this case by the third day the œdema of the legs and arms cleared up, and in a week's time the jaundice also cleared up, but he developed broncho-pneumonia for which he was put on Sulphathiazole and was fully recovered at the time of discharge. In this case there were several features which were misleading in arriving at a diagnosis, the patient having congestive failure symptoms and abscess pointing almost like a tent in the anterior abdominal wall and deep jaundice. My then chief called my diagnosis a bold one. This case illustrates the type of cases that come with symptoms of congestive heart failure. I have seen another case with symptoms of heart failure and generalised scabies. In this case, for a time at least, the liver abscess was missed. Text books do not mention this type of cases. The problem in this type of case is Emetine therapy. I am of opinion that the heart failure is only secondary to abscess liver and it can only be cured by drainage of the abscess and Emetine therapy. I advocate Strychnine or Coramine or any other cardiac stimulant to be given along with Emetine. I will refer to this point later when I come to the treatment.

In only a very small group of cases we get the abscess liver and dysentery being present at the same time. Motion examination may more advantageously be done for cysts, but it is not easy to spot them. In the analysis of 50 cases, in only two cases were E.H. seen. It is easier to look for such indirect evidence as thickening of the ascending or sigmoid colon. It is very exceptional for the transverse colon to show any evidence of thickening.

Rarely it is the complication that occurs in the course of the abscess that is likely to draw attention to the existence of the liver abscess. The abscess might burst into the neighbouring structures. By far the common sites for rupture of the abscess are into the pleural cavity and peritoneal cavities. When the abscess bursts into the pleural cavity, the prognosis is very grave. I have had four cases and none of them survived. Particularly operation and drainage should be avoided. In these cases, the collapsed lung may need decortication. In the literature mortality is recorded as 70 per cent for these cases. I have seen one case in which the abscess burst on to the pericardium. The case in which it burst into the pericardial cavity was a middle aged man. He was first seen by me in a mild state of shock with thready pulse and cold sweat. He complained of severe pain in the epigastric region. Examination showed liver enlargement two fingers breadth below the costal margin. I admitted this case as hepatitis. In the wards, he got over the state of shock and was quite alright in about three hours time. At this stage, he gave a history of periodic attacks of pain coming on two or three hours after food and being relieved by taking a little food. In view of the history I thought I was dealing with a case of duodenal ulcer. Fractional test meal showed low acid and barium meal series failed to reveal any defect in the duodenal cap. I thought of the ulcer with perigastric adhesions. By this time, again for no reason, while he was at perfect rest, he went into a mild state of shock. This only further favoured my suspicion of perigastric adhesion causing sympathetic disturbance and our consulting surgeon suggested that it might be only liver abscess and took over the case. He put the patient on Emetine $\frac{1}{3}$ gr. I.M. daily. After three injections were given, patient again developed a state of shock, but this time it ended fatally. At autopsy, it was found to be a liver abscess that had burst into the pericardium. In this case we had two misleading features. One was the periodicity of pain in relation to food simulating duodenal ulcer (subsequently I have elicited such a history in a number of cases). Probably it is the distension of the duodenal cap pressing on the inflamed liver that causes the pain. The second misleading thing was periodic cold sweat and a state of shock from which the patient recovers in the course of a few hours. Very rarely the abscess might burst into the perinephric tissues.

The aids to diagnosis are examination of blood, a skiagram of the chest, and, finally, aspiration of the enlarged liver.

Blood shows leucocytosis in the hepatitis stage and in the acute stages of the liver abscess. In some of the chronic cases, when the abscess is well walled off by fibrous tissues, leucocytosis does not occur. In one of the cases leucocytic count done three times showed only 4,000 per c. mm. The liver was enlarged to such an extent as to almost completely fill the entire abdomen, leaving only a very small area free between the margin of the liver and symphisis pubis. On opening, the abdomen was occupied almost completely by the liver, and on incising the liver 7¼ pints of pus was drained and scraping from the wall showed motile amœba. This patient was put on Emetine with complete recovery. A few days later, at the time of discharge, liver was only just palpable.

X-ray of the chest is a very valuable procedure. It may not be of any value when the abscess enlarged downward or is situated in the left lobe. It is of the greatest value when the abscess is situated in the right upper quadrant. In a few cases in which effusion right base is suspected, X-ray chest has shown only raising of the dome of the diaphragm without any displacement of the heart. In two cases where the patients were very markedly emaciated and complained of pain in the abdomen with doughy feel, they were suspected in one as tuberculous peritonitis with a just palpable liver and in the other as tuberculous pleural effusion right side. In both cases X-ray chest showed that we were dealing with liver abscess. Screening shows absence of diaphragmatic moving on the right side, in a large number of cases, but where the abscess does not occur in the upper quadrant, diaphragm might freely move with respiration.

Aspiration of the liver clinches the diagnosis and is also part of the treatment. Once a needle is put in and pus is drawn, aspiration should be done straightaway. I very well remember a physician putting in a needle in the morning and demonstrating to a batch of students the presence of pus. By night the patient developed acute abdomen and laparotomy showed that nearly a pint of pus had collected into the peritoneum. In the liver abscess the pus is under tension and a needle tract affords sufficient passage for the pus to leak.

Differential diagnosis in liver abscess.—As I said at the very beginning, a number of conditions may be mistaken for liver abscess. The common conditions which have to be differentiated are primary carcinoma liver and a liver riddled with secondaries. The liver that is the seat of malignancy has many factors that are likely to present misleading features. It is likely to show a low temperature, hard liver which might also be tender and moderate leucocytosis and skiagram may also show elevation of the right dome of diaphragm. Aspiration might show blood-stained material, and if the needle passed through a portion of the liver bearing malignant deposit or malignant changes, then the aspirated

material shows malignant cells as in one of my bronchogenic carcinoma cases with extensive secondary deposits in the liver. In another case, with primary growth in the gall bladder, with plenty of secondaries in the liver, it failed to show any malignant cells. Therapeutic response to Emetine may also be tried.

The other conditions to be thought of are pneumonia right base; pleural effusion right base, tuberculous peritonitis, peptic ulcer, typhoid and other long continued fevers, gumma of the liver, hydatid of the liver, perihepatitis occurring in cases of kala-azar and malaria cholecystitis both acute and chronic; adenocarinoma of the gall bladder; perinephric abscess and pyelitis and malignant tertian malaria and early cases of cirrhosis liver. I do not say I have completely exhausted all the possibilities. There are many conditions not mentioned by me, but I have mentioned the common ones.

A Hindu, male, aged 16, was admitted for pain in the legs and abdomen and night blindness of two months' duration.

Previous history:—History of dysentery four years ago. History of venereal sore 5 years ago. Habits: Occasionally takes alcohol, non-vegetarian.

History of present illness:—Two months ago patient had fever for ten days. This was followed by pain in the right hypochondrium.

This patient was an emaciated young man with œdema of the feet. Pigmentation of the palate, sclera and icterus. Abdomen: Liver enlarged, more than the left lobe and soft. No tenderness, palpable—three fingers breadth below the right costal margin and 5 fingers breadth in the epigastrium. The other systems were normal.

Blood W.R. was positive strong. Total W.B.C. 6,000 per c.mm. By liver aspiration through the right 8th interspace only blood was drawn. No pathogenic organisms were seen. X-ray chest showed moderate elevation of right dome of the diaphragm.

Patient was admitted as amœbic hepatitis. He was given a course of Emetine 1 gr. I. M. daily with no benefit. Since the left lobe was enlarged and only blood was drawn in the aspirating syringe left lobe, abscess was diagnosed and the case was transferred to surgical side. Under local anæsthesia laparotomy was done. Liver was not adherent to the peritoneum. Liver surface was smooth. Aspiration of left lobe also yielded blood only. Peritoneum stitched to the liver surface and packed with gauze.

In this case, patient had no fever to start with and at the end of 7 injections, started having fever. After the laparotomy on the 8th day, patient started having fever and this responded to Iodide by mouth. Eight months later, patient developed ascites. He was given mercurial diuretics and milk diet and ascites cleared. In view of the history of dysentery and enlargement of the liver and emaciation amœbic hepatitis was diagnosed. This should have been

revised in view of the left lobe being much more enlarged, leucocyte count being only 6,000 per cm. and the absence of response to Emetine. As a matter of fact, the temperature started going up on the 8th day of Emetine injection. With the history of sore on the penis five years ago, blood W. R. should have been done at the very first instance. This type of diffuse involvement of the liver by a syphilitic process is not common and is likely to be mistaken for an abscess liver.

For everyone of the conditions that has to be borne in mind, I can cite illustrative cases and I am sure you would also have seen cases of a similar nature.

The treatment in this condition that I adopt as a routine is to put the patient on Emetine 1 gr. daily I.M. for 9 days. If there is no urgency, then I prefer to aspirate at the end of the course, but where the pain is severe and abscess is bulging and threatening to perforate, I aspirate at the end of 3 grains of Emetine ; but where the symptoms are very urgent and where delay might mean rupture of the abscess any minute, I aspirate immediately after giving 1 grain of Emetine. But I always prefer, if conditions permit, to allow the patient to have at least three injections of Emetine 1 grain each daily, before I aspirate. This much of Emetine is enough to kill the active forms at the surface and aspiration tract is not likely to act as a passage for the amœba to spread.

Most of the symptoms clear up by the third or fourth injection. If a patient is markedly emaciated and general condition too poor, I do not prefer to give a lower dose of Emetine, but I give Emetine 1 gr. and Strychnine or Coramine along with Emetine. If the patient is febrile, he becomes afebrile by this time. I do not find any advantage in putting Emetine locally into the abscess cavity and I do not adopt that procedure. The aspiration with Potain's aspirator is the method of choice when the abscess is on the right side of the liver, to let out the pus. I have aspirated by this procedure in two of my cases as much as 64 ozs. But where the abscess is aspirated in the left lobe, open operation is the ideal method. Even for this, a preliminary premedication with Emetine is of great value in avoiding post-operative complications. Aspiration is done, if necessary, more than once at intervals of 4 or 5 days. Where there is urgency, I aspirate at the end of three grains of Emetine and repeat the aspiration at the end of 9 grains of Emetine.

After a course of Emetine, the patient is put on E.B.I. 2 grains at bed time for 12 nights.

I prefer to have the bowels regular and from the start I put my patient on Oleum Recini emulsion. By the time they have had about 6 grains Emetine, I shift over to Shark-liver-oil emulsion so that these emaciated patients may put on some weight.

Recently an anti-malarial drug was evolved called Chloroquine. It is marketed by Bayer under the trade name of 'Resochin'. This

was synthesised by Andersag, Breitner and Jung. This drug was found to possess an intensive anti-malarial effect. Due to war conditions, this drug was not available in India till very recently. This is designated as Chloroquine or SN 7618 by Americans. This drug is swiftly absorbed from the intestines after oral administration and is stored by the tissues of the body especially in the liver and lung; in liver in concentrations of 400–600 times higher than in the blood plasma. In view of this, the efficiency of this chemotherapeutic was tried in other protozoan diseases that affected the liver. The composition of Chloroquine is 7-chloro-4-(4'-diethylamino-1'-methyl-butylamino) quinoline diphosphate. It is a white crystalline substance which is easily soluble in water. Reports have come from several parts of the world that this drug is very useful in amœbic hepatitis and liver abscess and in pulmonary amœbiasis. I have so far used this drug in four cases to the exclusion of Emetine. In all the cases the result has been comparable to that of Emetine therapy. The temperature subsided within 24-48 hours and with that there was marked lessening of the pain and the patient felt better. This drug is not suitable for the primary amœbiasis of the intestine as the drug is absorbed in the small intestine itself. The great advantage with this drug is that it can be administered orally, is definitely less toxic and so can be administered even in debilitated states without any risk to the myocardium. The dosage recommended and which I have followed is from the 1st to the 4th day of treatment 1 tablet 6 hourly, from the 5th to 12th day twice daily and from the 13th to 21st day of treatment one tablet daily. Each tablet is ·25 gm. in weight. It is recommended that as far as possible the tablets should be administered after light meals. For the supply of Resochin (Bayer) I am indebted to Messrs. Chowgule & Co. (Hind) Ltd., Bombay. A more detailed report on the same will be published at a later date.

Prognosis in these cases is good if the abscess is aspirated or drained well and if the patient has not gone down in general condition too far. It is surprising how even very advanced cases respond to aspiration and Emetine.

In my analysis of 50 cases only 2 deaths occurred. Abscess liver is likely to recur if the patient takes to drinking alcohol again. This is one of the few conditions where under our very eyes, with proper treatment, a patient gets remarkably better in the course of a few days.

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8-c, Balfour Road, Kilpauk, Madras-10.

MALARIA MENACE—II

(HOW WE SUFFER)

P. N. GUPTA, B.SC. (Pb.), F.R.S.T.M. & H. (Lon.), M.R. San. I (London),
Malariologist, Station Hygiene Organisation, Shahjahanpur, (U.P.).

THE amount of suffering from malaria is *tremendous; there are numerous ways and means by which malaria is produced among us and the mosquitoes, its carriers, are produced in the Universe.

Malaria, as is particularly known to men of science and to the public in general, is transmitted from man to man through the agency of mosquitoes (female anophelenes) as per—

Clean Mosquito. (A) 10–14 days. (B) Infective Mosquito. Bites.

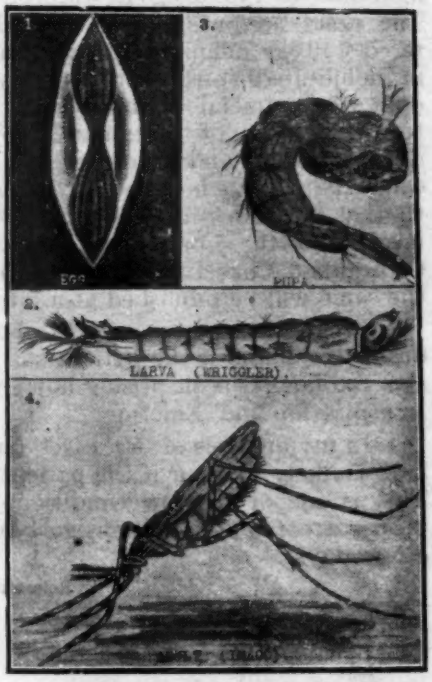
Human Carrier. (E) 7 days. (D) 10–14 days Sick patient. (C) Healthy man.

Mosquitoes, as commonly met with, are of two types: those that usually breed in dirty water, the watery stages (larval stage) of which have got their heads turned down in water and the adult stages (winged moving about) of which have a haunch back in resting position, are known as *culicines*; and those that breed usually in fresh water, the larvæ of which float and the adults of which sit horizontally on the walls are described as *anophelenes*. Life cycle is as :—

Egg —— Larva / Pupa ——→ —— Adult.

5 – 7 days.

FIG. 1.



* The first article in this series was published in the July, 1950 issue, pp. 523-534.

Optimum climatic factors are 68°F. temperature and 80% humidity.

Bionomics of adults.—Anophelenes being of many species, about 40 in number, the usually known carriers in India are—

Name of mosquito.	Habits.	Locality.	Type.	Breeding ground.	Usual biting time and range of flight.
A. Stephensi.	Prefer human blood.	N. W. India.	Domestic.	Stagnant water.	20-30–22-30 hrs. ½–1½ miles.
A. culicifacies.	Do.	All over India.	Do.	Stagnant water and slow moving water.	22-30–00-30 hrs. ½–1½ miles.
A. fluviatilis.	Both man and animal.	Foot hills and S. India.	Wild.	Stream.	—
A. minimus.	Prefer human blood.	Foot hills U.P., Bengal and Assam.	Domestic.	Slow running water.	Midnight/06·00hrs. ½ mile.
A. philli-penensis.	Do.	Bengal and Assam.	Do.	Rice-fields, stag. water	Just after sunset and midnight. ½ mile.
A. sundaicus.	Do.	Bengal.	Wild.	Brackish water.	22-00 hrs. until dawn. 1½ miles.
A. varuna.	Do.	Parts of Bengal, Orissa and Central India.	Do.	Rainwater, pools, tanks etc.	No evidence. ½ mile.

The life of the mosquito varies according to climatic factors and breeding places (Fig. 2, *vide page 186*) and is usually 2–3 months. Once infected, it remains so for 2–3 months. Once fertilised the female continues laying eggs throughout her life. *It is only the female infected anophelenes that can give us malaria.*

Breeding of mosquitoes.—Leaving aside the natural breeding of mosquitoes and our suffering from the same, due to climatic and geographical conditions, the most important of malaria suffering, which is totally avoidable, is the creation of our own hands *i.e.* by activities of human beings and by ignorance and neglect of laws of malarial sanitation.

'Increased facilities for breeding mosquitoes have been provided by man by :—absence of drainage, or badly constructed and badly planned drainage, leaking water taps, water storage receptacles, cisterns (Bombay), wells (Bombay), ornamental tanks, fountains (Delhi etc.), soakpits, garden sumps, disused receptacles, tins etc. and through the absence of proper drainage systems, or the presence of badly planned, badly constructed, or badly controlled drainage zones, improper siting of towns, villages or buildings, building operations giving rise to burrowpits, quarries, brickfields, tanks to soak concrete

etc. (Bombay, Delhi), badly kept and leaking irrigation channels (Punjab), over irrigation (Delhi), construction of docks, harbours without proper sanitary precautions, badly controlled or badly planned water supplies, indiscriminate opening up of jungle in certain areas etc.' (Covell). In some localities, *e.g.* the malaria

FIG. 2.

An Ideal Breeding Place.

vectors (carriers) may include species which breed in small wells, blocked up roof gutters, small water holding containers such as tins, vases, pitchers and burrowpits produced during the construction of commercial and industrial buildings in the centre of a city (Henderson). Bottles, discarded automobile tyres, old rubber overshoes breed enough mosquitoes in our houses.

Man-made malaria arising from war, changes in social and agricultural practices, population migrations and from the selection of unsuitable housing sites for permanent or temporary settlement and according to Henderson, the term is commonly applied to that (malaria) arising from the creation of breeding places of malaria carrying mosquitoes.

To have a thorough view of 'how we suffer', the various aspects of the problem are hereunder discussed:

Town and house construction.—Town Planning Commissions, in addition to surveying the site from geographical and strategical

importance, have also a responsibility to bear regarding the health of the inhabitants. As malariologists' advice on the subject is rarely sought, many a town had to be depopulated because of the malariogenic conditions prevailing on the site and its periphery before the construction of the town. Original site selected for New Delhi had to be abandoned on account of malarial conditions at the site, a great but rare achievement. Housing in lowlying areas and depressions has also to be condemned likewise and we have also to be careful about—

(*a*) Construction of water-butts and garden-sumps.

(*b*) Roof gutters, unless properly constructed and maintained in good repair, are dangerous as neglect of such precautions proved to be a fruitful source of malaria in Bombay. Water for soaking concrete on flat roofs usually breed mosquitoes.

(*c*) Storage tanks for mixing of cement and water used for flooding newly laid concrete floors, roofs etc.

(*d*) Mosquito proofing of houses which has already established its worth in America, Africa, Italy, the Federated Malay States and British troops barracks in India.

Water-Supply.—Though great importance, as deserved, is attached to water supply for the public and the individuals, little attention is paid to the overflow. The wells are seldom made mosquito proof, numerous leaks and seepages occur along the piped supply, cisterns are rarely mosquito proofed and the cement platforms, if at all made around stand pipes, do not satisfy requisite specifications. A great opposition to the malaria gang is met by those who are so fond of maintaining ornamental waters or when the gangman goes for the treatment of troughs for watering animals or for washing purposes. Is it not what we can easily avoid ?

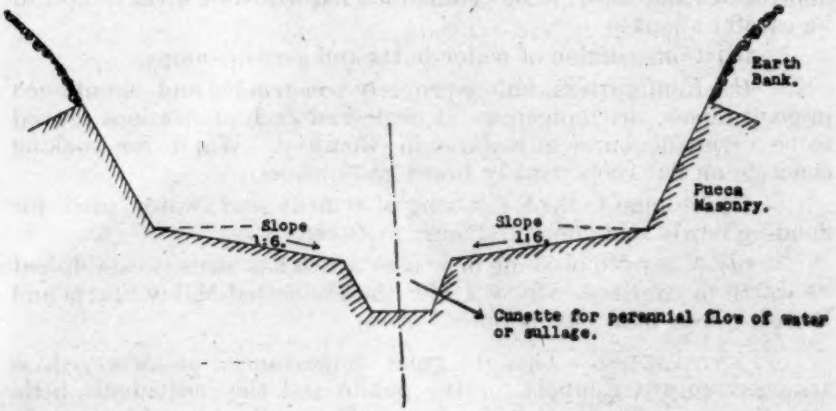
Drainage.—Irrigation without a proper drainage system results not only in increase of malaria, but also in a serious decline in the agricultural prosperity of the area. Just as œdema occurs in human beings due to obstruction in the veins, so water-logging occurs if the excess water is not drained of.

Incorrect planning of domestic drains or their altogether absence is a serious crime of malarial engineering. For example, generally the drains do not have a suitable gradient, outfall is not proper, the drains pass under the house or courtyards.

Storm water drains usually get silt-laden during the rainy season by the earth being washed into the drain. Engineering which plays a great part in Malariology, sometimes omits essential requirements required by a malariologist *e.g.* provision of a Cunette (Fig. III, *vide page 188*) branch drains to join the main drain at an acute angle (not right angle). Provision of open culverts in place of syphons, avoidance of abrupt falls, and again provision of manholes which are rarely mosquito proof or mosquitoes are capable of

entering into underground drains at the entrance of small drains, or storm water drains at their outlet into a river or canal become 'headed up' when the river or canal is in flood, because the discharge point has been placed at an unusually low level. Provision of automatic tide gates is a necessity in drains having tidal influence.

Figure No: 3.



SECTION OF STORMWATER DRAIN WITH CUNETTE. (Mulligan - Afridi).

There are many other minor points which are of importance for malariology and that is why joint planning of drainage by an Engineer and a Malariologist is recommended, as has already been experienced in Delhi where it has been proved 'that the Central P.W.D. is capable of not only executing anti-malarial schemes in the most expeditious and efficient manner but also of taking a keen and active interest in the furtherance of anti-malarial work.'

'Many of the precautionary measures advocated are neither difficult of execution nor associated with appreciable additional expenditure. Neglect of these at the time of construction will, on the other hand, eventually necessitate remedial measures which will often be difficult, costly and sometimes not entirely satisfactory.' 'The chief obstacle to overcome is the barrier of tradition.' To alter established malpractices requires great planning, perseverance and all-out cooperation.

Irrigation.—'A majority of the breeding places created by man are related to irrigation systems, burrowpits along railroads and highways, and obstructions to natural drainage. It is estimated that about 25,000,000 cases of malaria are caused annually by such situations and result in socio-economic losses totalling many crores of rupees.' (Henderson).

Whereas the peasants and rise in subsoil water levels are responsible for undesirable by-products of an irrigation system, engineers are equally to be blamed. For example, imperfect drainage causing water logging, leaky sluice gates, seeping canal banks, burrowpits, defective distribution chambers, immoderate water supply and improper delivery of water, poorly maintained canal banks and beds and lack of sufficient number of bridge crossings, are some of the engineering faults narrated by Dr. Russell.

'Unfortunately it is true, as a rule, that the cost of corrective measures is disproportionately greater than would have been the extra initial outlay required to obviate mistakes.' So why not be vigilant and co-operate from the very beginning ?

1. *Inundation irrigation* :—Due to time, and labour spent and on account of the quick flow of water from wells, well irrigation is the anti-malarial method of choice. Inundation irrigation practised in many ways *e.g.* flooding of tracts of country by the overflow of silt-laden water from rivers, does not cause much malaria, but irrigation done by conducting flood water from rivers and streams by way of inundation canals which are filled only when the river level rises to a certain height, *i.e.*, when the river is in flood, is sometimes associated with high incidence of malaria as it happened in Sind. Another method where the inundation canals arise above a bund or barrage behind which the water is dammed up, and is consequently raised to a sufficiently high level to allow of its entry into inundation canals is not much malarious, except where the dams or barrages employed are responsible for raising the subsoil water level in the territory above them, in which case a high degree of malaria prevalence may result.

2. *Perennial irrigation* :–In this type of irrigation, water is carried in canals which are constructed at high levels, and is fed to the fields by gravity. In our country this type of irrigation has almost invariably been associated with a high incidence of malaria and as has usually happened, this does not become apparent until after the scheme has been in operation for a number of years. According to Rao, 'Malaria has followed the development of each irrigation project in the Mysore State, in the Cauvery and the Hemavati basins, in the Vanivilas Sagar Project in Hiriyur, the Boran Kanave Project in Tumkur District, the Marconhalli Project and the Kanva and Byramangala Projects in the Mandya, Tumkur and Bangalore districts.

Although the malarial danger arising out of Irwin Canal Project was foreshadowed and put forward by Malariologists, yet as it usually happens, their advice was ignored and the essential provisions of drainage and dry belts around villages were left out, and this resulted in a serious problem involving 2 lakhs of population within about a year of starting irrigation. 'The loss of life became so appalling and the situation became so alarming within 3 years that

serious attention had to be paid to this area' (Rao), and it is only now that the situation is improving.

At the Sarda Canal head works in the notoriously malarious Terai of Uttar Pradesh, Clyde (1931) says that 'In the first year of the work, before anti-malarial measures were started, work had to be closed down in April because 96 men out of every 100 imported were down with fever at one time. Contractors refused to carry on the work and cleared out one after another, and it was realised that unless active measures were taken the headworks would never be completed.'

Most regrettable, but usual accompaniment of all canals is the creation of innumerable number of burrowpits, occurrence of seepages in the surrounding territory, provision of insufficient number of bridge crossings, breaches in canals, distributaries or watercourses and the worst is giving rise to the condition of 'water logging' due to loss of a high percentage of water by percolation from main and branch canals. This condition is associated with an increase in local relative humidity which facilitates the spread of malaria. Water logging, as happened in Lloyd Barrage (Sind), had disastrous effects on the health of people and the productivity of the soil. These conditions if premeditated, can certainly be avoided. Suffering from water logging in the Punjab has already been discussed in the first article of this series.

Perennial irrigation is also associated with a liability to over irrigation, a customary practice with agriculturists as actually happened in Java where excessive irrigation continued throughout the year. In the absence of a drainage system, this produced such a high incidence of malaria and such a poor yield of rice, that the irrigated area began to be depopulated.

'Unfortunately many of the issues referred to above do not ordinarily receive attention, with the result that perennial irrigation in India has almost invariably been associated with a high incidence of malaria.'

Leaking hydrants and sluice valves are dangerous if irrigation is done by piped supply of unfiltered water. But this is the method of choice for urban areas if proper care is taken and a meter installed. Herms and Gray simplify to say 'It is a strange comment on human intelligence that most irrigation districts have been organized, financed and constructed without any consideration of the problem of removing the inevitable seepage and surplus irrigation water.'

3. *Rice cultivation* :—It is not the fact of rice growing, according to Covell, which is important but the type of country in which it is growing and the method of cultivation. Out of the vectors found in India, all rice fields are dangerous in places where A. annularis is the carrier (Foot hill areas), seeping rice fields and fallow are very dangerous so long as the fields are wet. According to Senior White, if

transmission period is the S. W. monsoon, A. culicifacies is dangerous until the rice plants are more than 12" high and Sen states that 'the anophelenes prefer to breed within a range of 2 to 12 inches of water in the cultivated rice fields. They avoid deeper water.'

4. *General considerations (irrigation)*:—Wet crop cultivation (rice, sugar-cane, sweet-potato etc.) within half a mile of local habitation, obstruction of old canal beds by roads, railways or new canals, presence of herds of cattle, especially water buffaloes in canal, nullah and anti-malarial drain beds, are all factors by virtue of which we suffer and these are all our own creations. I wish we could be wise enough to avoid such causes of our suffering and increase national health.

Malaria and engineering.—*Introduction*:—There is much truth in Sir Malcolm Watson's dictum that 'work which without excuse leaves a trail of malaria behind it, is bad engineering.' In their report, the Bhore Committee states that 'an unfortunate feature of the present malaria situation in the country is that, in many parts of the populated areas of India, man has been directly responsible for its incidence through creating conditions favouring the multiplication of the transmitting species of mosquito. For instance, embankments constructed in connection with roads and railways have, in many cases, interfered with natural drainage and have promoted water-logging. Burrowpits are an accepted accompaniment of ordinary house-building operations and other engineering works. In more recent years projects designed to better the economic condition of large sections of the population have resulted in unnecessary addition to their misery. Irrigation projects, which bring water to previously dry areas, will produce malaria unless measures are taken simultaneously for adequate drainage to prevent the development of marshy conditions. The Sukkur Barrage and the Mettur Irrigation Project stand as object lessons of the result of failure to make such provision. In both cases malaria developed on a large scale in regions which were previously free from it.'

As Covell has described, 'A considerable amount of unnecessary sickness and loss of life would be prevented if all engineers working in the tropics were required to attend a short course of instruction in the principles of tropical sanitation before taking up their duties.'

It is not the engineers only that are to be held responsible for engineering-made malaria, but equal responsibility is shared by budgetry control also, as 'no one will deny the tendency of Government departments to look upon problems from the point of view of how they affect the budgets of their own department and not that of the administration as a whole. Co-operation between different departments is essential in the interests of the finances of the Government as a whole and not that of any one particular department, and 'while the outlay for such remedial measures may not fall upon the budget

of the engineering department responsible, the cost has however to be paid for by the same province or industry either in money, in economic loss, in sickness, or in lives.

Malaria, as is evident, can be caused at each and every step of engineering and any single fault can produce disastrous effects. Engineering being a very vast subject, the most important malarial aspects of it will be dealt with under a few separate headings :

Roads and railway constructions.—Severe epidemics of malaria occurred during the construction of Colaba Causeway (1838-1841), Back Bay Reclamation Scheme (1861-1866) and also during water works construction near Bombay, railway construction in Rajshahi, road in Burdwan etc.

A committee for the co-ordination of policy regarding the prevention of malarial conditions produced during the construction of roads and railways, convened in 1947 by the Government of India summarises 'the principal features of railway and road construction which favour the spread of malaria :

(1) Interference with natural drainage by the provision of an insufficient number of culverts or of culverts incorrectly placed.

(2) The creation of burrowpits without provision for their drainage, either to obtain earth for embankments or in the process of quarrying for stone or gravel.

Anti-malaria drainage differs in many respects from other engineering activities, the chief being that meticulous attention to details and continuous maintenance are all important. If these are neglected the scheme from the anti-malaria view point may be a total failure. In the disposal of storm water for instance, drainage measures may fail because whilst great attention is devoted to its rapid disposal, too little is given to the removal of all water after the storm has passed. Again, whilst a system of flat bottom drains may be perfectly effective in rendering an area fit for agricultural purposes, malaria may actually be increased unless a cunnette is provided, or the bottom shaped and maintained as a shallow V' (Covell).

Culverts.—' Where there are no other considerations involved, there is a tendency to provide only that number of culverts which will ensure that the road or railway will not be washed away or damaged by floods. This is insufficient for anti-malaria purposes. Any interference with natural drainage will result in an increase of mosquito production and hence of malaria. Furthermore, it must be ensured that natural drainage will be unobstructed, not only under normal conditions, but also in years of abnormal rainfall and flooding.'

Correct placing of culverts and their design are of great importance. Clarke condemns the box culverts as a public menace on account of 'the unpardonable dereliction in the design of a bottom which, being an integral part of the structure, may not be tampered with.' He criticizes the 'equalizer culvert' as an admission of failure,

having no outlet but simply permitting water to stand at the same level on both sides of the road. The anti-malarial choice of a culvert is, according to him, a bottomless culvert which will allow the deepening of the stream bed.

Embankments, burrowpits, excavations etc.—Road and rail embankments not only obstruct natural drainage but also raise the level of the subsoil water, producing numerous water collections for mosquitoes especially at points where road and railway embankments intersect *e.g.* Western Bengal area, near Nizamuddin (Delhi), Ambala.

'Burrowpits which follow the line of our roads and railways help to provide additional breeding grounds. (Fig. IV). Bengal is

FIG. 4.

Row of enormous burrowpits along the Agra-Delhi Chord Railway embankment, New Delhi. These were filled in 1937. (Mulligan-Afridi).

generally cited as an outstanding example of man's thoughtless interference with natural drainage resulting in the steady rise in the incidence of malaria over the greater part of that province.'–(Health Survey and Development Committee).

According to the Engineer Mr. Cochrane, the earth required for embankments is obtained from :—

(*a*) By transfer from adjacent 'cuttings' along the road.

(*b*) By the excavation of drains at the roadland boundaries.

(*c*) From burrowpits dug outside roadland boundaries.

It is the third category which is dangerous because :—

(*a*) They increase malarial incidence, especially because of their location near towns and cities.

(*b*) Reduce the fertility of the land.

(*c*) Produce unsightly appearance.

Against all the initial creation of burrowpits and their devastating effects, there is a continuous drainage on the health of the country in having to combat malaria produced from mosquitoes of burrowpits continuously being dug by road maintenance parties, who produce thousands of new undrained pits each year and spoil gradation of roadside drains (through which water had found its own course and thus graded it) by removing earth from here and there and thus creating pits inside drains.

The practice of rice cultivation or leasing them out for fishing add to their being the most dangerous man-made malarious problem.

Quarrypits and cuttings are likely to expose seepages and these produce ideal breeding places for malaria carrying mosquitoes. Initial provision of drainage is a very easy control measure, but is still mostly neglected.

Yet another engineering fault for a malariologist is lack of proper care in avoiding leaks, seepages or overflows from the main body of water in dams and barrages. The results in high incidence of malaria and sometimes introduces malaria in otherwise dry areas *e.g.* Sind Barrage.

Cleaning of jungles :—'It is frequently necessary for the conduct of certain engineering projects to clear jungle and remove undergrowth. The effect of such operations on the incidence of malaria may be beneficial or disastrous for the clearance of jungle may transform comparatively safe waters into extremely dangerous breeding places or *vice versa*' (Mulligan and Afridi). As wholesale jungle clearance in connection with large construction works is liable to produce such highly malarious conditions that a project may have to be abandoned owing to sickness among workers, why not avoid it from the very beginning by requisitioning the services of a malariologist on the board.

Tropical aggregation of labour :–For canal, railway, irrigation and road projects, employment of enormous labour force is necessary, which, if it remains uncared for, not only itself suffers from malaria but spreads the infection in all nearby villages. The construction of the Panama Canal is a well known fact. 'In 1883 France had undertaken to build a Canal connecting the Atlantic and Pacific Oceans, but after 20,000 deaths and thousands of desertions among the French workmen the job was given up as too difficult. In 1904 when the United States assumed responsibility for completing the Canal, General William Crawford Gorgas, a native of Alabama, was sent to Panama to take charge of the health and sanitation work. General Gorgas and his corps of sanitary inspectors, knowing that Anopheles mosquitoes were the cause for the spread of malaria, took steps to destroy the mosquitoes and the places in which they were breeding,'

(Alabama State Board of Health) and then only the Panama Canal could be completed.

So it is very necessary in the interest of work to be undertaken that malaria amongst the labour force should be reduced to a minimum and adequate steps taken regarding camp site selection, spraying of quarters and tents, antilarval measures, personal protection and suppressive treatment. Details of these measures will be furnished in subsequent issues of the journal.

Contracts and leases:—Having at length discussed the various causes of our suffering due to malaria, it is realised that many of the conditions which favour the increased incidence of malaria in connection with construction works are the direct responsibility of the contractors and not of the engineers concerned. The engineers and administrative officers will do a nation wide service only if they are careful about malarial conditions at the time of giving contracts and include such clauses in contracts and leases that will not give rise to malarial conditions.

Conclusion.—We realise therefore—

1. 'That there are a countless man-made breeding places unintentionally created every day and overlooked except by a mother mosquito with an urge to lay eggs' (Virginia State Board of Health).

2. 'That there is a natural tendency to curtail expenditure on preventive measures in the very beginning and especially as the incidence of malaria begins to fall, and that the engineer while caring for his own department's budget, creates directly or indirectly greatest malarial conditions in the country, most of which is avoidable.

3. 'That ruinous economy which, by sparing a little renders all, that is spent, useless, infected the British Council (Southey, 1813).

W.H.O. Expert Committee on Malaria recommends therefore 'that even more important than educating the general public is the vital need to acquaint administrative officers and engineers of all branches with the basic principles of malariology.'

Malaria suffering is every man's cause, administrators', Governments', doctors', engineers', philanthropists', educationists', agriculturists' and all have a national duty towards its control, as Thiruvalluvar's Kural says:

'Man is born a social being, he alone lives who works for the world's welfare. All others may be counted as dead, though they may consider themselves to be alive.'

THE SIGNIFICANCE OF THE BILATERAL TENDERNESS OF THE MEDIAN NERVES *

J. J. JOSEPH,
Retired Leprosy Officer, Madras.

THE *median nerves*, and not infrequently the *radial nerves*, have been found to be bilaterally tender in some diseases; the former at a point medial to the medial wall of the cubital fossa and the latter lateral to the lateral wall of the same fossa; the former just before it begins to branch and the latter just before it finally bifurcates. At the point of tenderness the median nerve lies between the two heads of the Pronator Teres and on the medial aspect of the brachialis, while the radial nerve lies between the brachialis and the brachioradialis and in front of the lateral epicondyle of the ulnar bone.

Course of the median and radial nerves

The median nerve arising from the lateral and the medial cords of the brachial plexus descends at first through the arm lateral to the brachial artery and then crosses behind it and lies to its medial side at the bend of the elbow. No branch is given off in the arm.

The radial nerve is the continuation of the posterior cord of the brachial plexus. It winds round from the medial to the lateral side at first between the medial and long heads of the triceps; it then lies in the spiral groove between the bone and the lateral head of the triceps; then on the lateral side of the limb it pierces the lateral intermuscular septum, passes between the brachialis on the medial side and the extensor carpi radialis and the brachioradialis on the lateral side, to the front of the lateral epicondyle where it finally bifurcates into the deep and superficial radials. Before it reaches the elbow, it gives off branches to the three heads of the triceps, to the anconeaus, the brachioradialis and the brachialis, and the posterior brachial and antibrachial cutaneous branches.

The bilateral tenderness of the median and radial nerves

This was at first frequently detected in the active progressive types of leprosy such as those with multiple hypopigmented lesions, other active neuro-macular lesions and early lepromatous macules. In the more established lepromatous cases and neuro-anæsthetic cases, the sign was usually found to be absent. In the types of leprosy where the median nerves were bilaterally tender, the ulnar nerves were not usually tender or thickened. In most cases there were no lesions over the areas of distribution of the nerves.

Presuming that this was a form of neuritis, I examined patients suffering from diseases simulating leprosy sent to me for opinion from the Stanley Hospital wards and other departments. In a few of these cases also this sign was elicited:—

(1) An advanced case of peripheral neuritis.

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* Specially contributed to THE ANTISEPTIC.

(2) Three cases of secondary syphilis, and one case of congenital syphilis with leucomelanodermia.

(3) A case of radial paralysis of one hand only–cause unknown.

(4) Three cases of dermal leishmaniasis.

In the General and Royapettah Government Hospitals, I examined some cases of fever, and found this tenderness in the following :—

(1) Fifty one cases of typhoid mostly in the end of the second week of the disease. The ulnar nerves were not found to be tender. This tenderness disappeared when the temperature was normal.

(2) A few cases of lobar pneumonia in the later stages of the disease. One had tenderness the day after the crisis.

(3) Six cases of Kala-azar.

Over 100 Corporation school children with lesions of early leprosy were examined ; a few of them had bilateral tender nerves. In a Montessori school with 80 children between ages 5 and 8, not one had bilateral tender nerves which proves that this sign cannot be elicited in normal persons. It was also observed that in a few active neuro-macular cases with lesions all over the body and with bilateral tenderness of the median nerves, this tenderness disappeared when the cases were rendered symptom-free. The peculiarity is, as has been mentioned before, that when the median nerves are tender in the active early types of leprosy, the ulnar nerve is generally neither thickened nor tender. But when the ulnar nerve becomes thickened, this bilateral tenderness is not usually elicited, unless the ulnar nerves are also tender.

It is therefore evident that this sign is not pathognomonic of leprosy, nor can it be considered to be due to traumatic pressure as the median nerve does not lie directly over the bone and as physicians have tested patients for this tenderness and have elicited it. Moreover, however hard the ulnar is pressed against the bone as it lies in the olecranon groove, tenderness cannot ordinarily be elicited. Therefore, this tenderness has some significance.

This sign can be elicited by extending the forearm and exerting slight pressure at first which is gradually increased but not to the extent of traumatic or deep pressure. The pressure has to be made an inch lateral to the medial epicondyle to test the median nerve and an inch medial to the lateral epicondyle to test the radial nerve. Occasionally the radial nerve will be found to be more tender than the median, but generally the median nerve is more tender.

Nerve affections in leprosy

The following nerve affections are commonly met with in leprosy :—

1. *Thickened but not tender* cutaneous nerves with lesions over their areas of distribution, especially when the lesions are of the

tuberculoid types:—supra-orbital, great auricular and its branches, cervical cutaneous, medial antibrachial and its branches, middle supra-clavicular, superficial radial, dorsal branch of ulnar, superficial peroneal, sural, etc. The leprosy workers in Calcutta are of opinion that these nerves are usually tender, but in my experience I have not found these nerves usually tender when thickened, especially when they are thickened in relation to tuberculoid lesions. There may be complete or partial anæsthesia over their areas of distribution, usually the latter.

2. *Thickened and tender* nerves, generally not the cutaneous ones, with lesions over their areas of distribution, with symptoms such as anæsthesia, neuritis, neuralgia, etc.:—the ulnar in the olecranon groove and the common peroneal behind the head of the fibula. Generally there is complete anæsthesia over the areas of these thickened nerves.

3. *Tender but not thickened* nerves, generally the cutaneous, with neuromacular, especially simple macular, lesions over their areas of distribution, such as the infratrochlear near the inner canthus of the eye, the supratrochlear at the junction of the inner one-third and outer two-thirds of the eyebrow, the infra-orbital at its exit from the infra-orbital foramen.

4. *Tender but not thickened* nerves with no lesions over their areas of distribution, but with lesions on any part of the body, such as the median and the radial—the subject under discussion. Sometimes the tibial nerve has been found to be tender at a point where it bifurcates into the plantars.

Thickening of nerves without tenderness does not seem to be of much significance in leprosy. Tenderness with or without thickening is suggestive of activity of the disease. The subject under discussion is tenderness without thickening of nerves and without lesions over the areas of distribution of the nerves concerned. The bilateral tenderness of the median nerves which are not thickened and with no lesions over their areas of distribution, points to some systemic factor. As this tenderness is present not only in leprosy but also in certain other diseases, this factor is evidently not related to any particular disease and may possibly be due to some cause which activates the disease.

Discussion.—This tenderness is a sign which is elicited and is not associated with neuritic symptoms; it is a sign and not a symptom; it is not pain ordinarily felt by the patient but pain elicited by the doctor; it is localised and not referred; there is no lesion over it or in its vicinity or over the area of distribution of the affected nerves.

This tenderness is bilateral:—In the case of the median nerve it selects a point where it begins to branch and in the case of the radial a point where it finally bifurcates. Naturally the questions one would ask are: Why is this tenderness bilateral? Why are

only these two nerves tender ? Why are the points near the elbow selected ? Has this tenderness any significance ?

1. *Is this tenderness due to traumatic pressure* ?—A few doctors have told me that in any individual this tenderness can be elicited. It is only by constant examination, particularly of typhoid patients, that one can differentiate between this tenderness and traumatic pain. The median nerve rests on the brachialis and the radial nerve lies in front of the lateral epicondyle. In the case of the former normally great pressure has to be applied to press it against the bone, but such pressure need not be exerted to elicit this tenderness. Even when much pressure is used to press the ulnar nerve against the bone as it lies in the olecranon groove, this tenderness cannot be elicited except when there is an active lesion over its area of distribution or when the disease is in the metastatic stage. Moreover, the examination of several healthy persons will reveal that this tenderness is absent in them.

2. *Is it due to lymphatic spread of toxins from a lesion ?* :—I have already stated that there is no lesion over the point of tenderness or in its vicinity or over the area of distribution of the nerves. The lesions must be symmetrical for this tenderness to be bilateral, but such lesions are seen only in the more advanced neural and lepromatous types where this tenderness is not usually elicited. The same is the case with typhoid where the lesions are far from the point of bilateral tenderness of these nerves. Therefore this tenderness is not due to lymphatic spread of toxins from a lesion.

3. *Is it related to tissue immunity*? :—Several tests with Lepromin on cases of leprosy with and without bilateral tenderness of nerves, were performed in the Stanley and General Hospitals. The Lepromin for this purpose was kindly supplied to me by Drs. Muir and Dharmendra. Tests were made with a view to establish a relationship between Lepromin reaction and bilateral tenderness of nerves. As Lepromin reaction is generally negative in lepromatous cases, these cases were not selected for the test. Among the neuromacular cases, at least 40% are negative to this test and so neuromacular cases with and without bilateral tenderness were tested. Among those with bilateral tenderness, there were positive and negative reactions ; so also among the cases without bilateral tenderness. So a relationship between Lepromin reaction and bilateral tenderness was not established. In other words, this bilateral tenderness is not related to tissue immunity.

4. *Is this tenderness due to toxicity*? :—I have already stated that in the more advanced lepromatous cases with innumerable bacilli, with tendency to leprous reaction and with lesions even over the distribution of the median nerves, this bilateral tenderness is usually absent, and that in many neuromacular cases where the smears are negative for M. lepræ by the recognised present-day standard methods, this sign is present. So in leprosy this tenderness

is not related to toxicity. In febrile conditions like typhoid and pneumonia, there may be a relationship between this bilateral tenderness and toxicity as this sign is elicited when the patient is in a toxic condition, whereas in diseases not accompanied by fever, such as pellagra and dermal leishmaniasis, such a relationship cannot be established. It is not unlikely that in leprosy, a chronic disease, this bilateral tenderness was present in the earlier stages before the case became lepromatous, and that the response to a factor which caused this tenderness, has now become weakened, just as the response to stimulus weakens in a fatigued horse; whereas in the febrile acute diseases, the period of activation of that factor is not long enough to cause 'exhaustion' of it to cause it to fail to respond. We have therefore now to search for that factor.

It therefore seems that this tenderness which is bilateral shows activity of the disease rather than toxicity, like the filling of a tank and not of a tank which is full, and that the cause of this activity is an activating factor, probably a systemic one, failing to act when it has reached its maximum capacity of action or when its action is arrested. What is that factor ? Where is it likely to be found ? How does it act ?

6. *Is this tenderness due to intestinal sepsis of toxaemia*?:—There is no doubt that in certain septic conditions, such as septic teeth, septic tonsils, etc., there is bilateral neuritis, and even bilateral tenderness of nerves. Whether such septic conditions cause bilateral tenderness of the median nerves only, one cannot say. Tenderness of the muscles and neuritic pains, not infrequently shooting down the ulnar side of the arm, are not uncommon manifestations of septic conditions. But here we are concerned with a localised tenderness and not with neuritic pains, a tenderness elicited over a particular point in the course of particular nerves.

That gastro-intestinal infection or irritation or any interference with the absorption of food or with the intestinal secretions, reacts on the human system, is admitted by all. In typhoid, though the lesions are concentrated in the lymphoid tissue of the gut, the toxins will affect the rest of the intestinal tract. I may go so far as to state that in all active diseases the normal functions of the intestinal tract suffer. Even in leprosy in the metastatic stage, with or without febrile symptoms, there is a certain amount of intestinal sepsis, for, in dealing with reactions, both leprous and tuberculoid, I have obtained good results by the administration of intestinal antiseptics in addition to diaphoretics and diuretics. So it is not unlikely that any interference with the normal functions of the intestinal tract will interfere with the production or synthesis of those substances necessary for the various tissues in the body. Probably an inhibition of the substances required for nerve tissue and for the maintenance of the reticulo-endothelial system at the level of efficiency, is found in the intestines.

7. *Is this bilateral tenderness due to deficiency of vitamins* ? :— This bilateral tenderness is not a neuritis in the strictest sense as it is not accompanied by symptoms of nerve irritation, or of pressure by inflammatory products. It is a localised pain over a nerve which is not thickened. Other nerves are unaffected and so this shows that there is a systemic factor which has a predilection for these median nerves only, just as in metallic poisoning certain metals have a greater affinity towards certain nerves than towards others. So this tenderness has some relation to some substance connected with the nerve tissues.

In the intestines two important vitamins are synthetised—Aneurine Hydrochloride and Nicotinic Acid; the former is concerned with the nutrition of nerve tissue as well as tissue oxygenation, while the latter is concerned with protein and carbohydrate metabolism, and oxidation and reduction processes in the tissues. If it is conceded that the hyperæmic effect of Nicotinic Acid will result in increased phagocytosis, this drug can be said to raise the efficiency level of the reticulo-endothelial system. The synthesis of these two vitamins can be inhibited in the gut by:

(1) Interference with the absorption of food (diarrhœa and dysentery), or increase of basal metabolism due to pyrexia or by the foods being absorbed by the parasites in the gut.

(2) Lesions of the intestinal tract—by absorption of the intrinsic factor or by destruction of that part of the bowel producing the intrinsic factor.

(3) By restricted food intake or unbalanced diet.

(4) By the bacteriostatic action of the Sulpha and Sulphone drugs.

The inhibition and consequent deficiency in these vitamins probably results in the bilateral tenderness of the median nerves which seem to be particularly selected to denote this deficiency. The response of the median nerves to the deficient vitamins will pass off when the deficiency is made up, or when the disease ceases to be inactive as in the case of typhoid, or when the intestinal tract is restored to its normal condition to carry on its normal functions, or when the power of responding to the stimulus weakens.

Summing up, it would seem:

(1) That the bilateral tenderness of the median nerves is due to a disturbance of a systemic factor which has some relationship to the functions of nerve tisue.

(2) That this disturbance is caused by Vitamin B_1 and Nicotinic Acid deficiency; the former because it is concerned with the nutrition of nerve tissue and the latter because it is concerned with the reduction and oxidation processes in the tissue and probably with the resistance of the body to bacterial invasion.

(3) That this vitamin deficiency is caused by the inhibition of the synthesis of Aneurine Hydrochloride and Nicotinic Acid in the gut for various reasons, such as gastro-intestinal irritation, intestinal sepsis.

(4) That this disturbance in the synthesis of these vitamins serves as an activating agent deciding the course of the diseases giving it as it were a 'momentum.'

If the theory advanced for the bilateral tenderness of the median nerves is rational, the administration of intestinal antiseptics and Vitamin B_1 and Nicotinic Acid in diseases where this bilateral tenderness is present, may help in controlling the activity of these diseases.

Sensitization Caused by Streptomycin in Nurses

Dr. Justin-Besancon and his colleagues report 40 cases of sensitization caused by streptomycin in nurses employed in various hospitals and sanatoria. Neither age nor sex seemed to act as predisposing factors. No history of previous allergy could be traced in 36 nurses. 5 per cent eosinophilia on an average, was noticed in the 40 nurses. In 24 of these, sensitization disorders occurred one to six months after they had first come in contact with streptomycin. This interval did not exceed 10 months in any case.

Handling the laundry of patients treated with streptomycin or presence in a ward where streptomycin was regularly handled sufficed to produce or re-produce the sensitization disorders in some nurses. More than 20 of them had headaches and 12 complained of vertigo. Pruritus was often limited to the hands and eyelids but was generalized in 8 nurses. 28 nurses had blepharoconjunctivitis and more than half of them had eczematoid dermatitis particularly in the peripalpebral region and 8 had it on the hands and arms. Urticaria or icterus was *not* observed.

Treatment consists exclusively in the cessation of the handling of the product or in a change in service. From the legal point of view the cutaneous manifestations caused by handling streptomycin should be classified as 'occupational disease'.—*Sem. Des. Hopit.*, Paris., 25, 2389-2391, 1949 : *Eng. Abst.*)

Unrecognized Pernicious Anæmia Mistaken for Arthritis

Dr. W. J. Ford reports the cases of 2 female patients aged 63 and 74 in whom subacute combined degeneration of the spinal cord progressed because they were erroneously treated for chronic arthritis, with deleterious results. Intensive liver therapy, though instituted late led to partial recovery. Ford is inclined to the view that the gravity of the neurological lesions in pernicious anæmia and the partial recovery on liver therapy make early diagnosis very important. In the absence of a really accurate clinical appraisal, subacute combined cord degeneration might be easily (and wrongly) diagnosed and treated as chronic arthritis to the detriment of the patient.—*Illinois Med. Jour.*, 96, 318-321, 1950.

SHORT WAVE THERAPY,
BASED UPON SOUND THEORETICAL FOUNDATIONS AND PRACTICAL EXPERIENCE*

LIEUT. A. J. GOMEZ,
Villa St., Raphael, Kotagiri.

I. General remarks.—The development of high frequency therapy has been closely associated with that of high frequency and radio engineering technique, and advances in the latter have been followed almost immediately by progress in medical applications.

In diathermy the spark-gap invented by Max Wein for radio telegraphic technique was applied to the generation of high frequency currents.

The most important development has resulted from the application of Thermionic Valve to high frequency current generation, effecting a complete revolution in radio-communication technique, and eliminating the spark-gap previously employed. Modern radio telephony and broadcasting have, in fact, developed as the result of this invention.

The special physical effects of these large ultra-high frequency currents and the distant effects of the corresponding ultra-short waves produced by them suggested the advisability of investigating the possibility of their application in the field of therapy.

Schliephake made the first experiments on human bodies in the electric condenser field and so laid the foundation of short wave therapy. Previous experiments with animals had shown the possibility of biological reactions.

It is not correct to consider short wave therapy to be an improved form of diathermy. The biological and therapeutic effects of short wave therapy are of a completely different character and hence it must be inferred that a second characteristic specific action must be occurring in addition to the thermal action.

It embraces in particular diseases which are contra-indicated in the case of diathermy treatment proper especially in ailments of this kind (acute iuflammatory, purulent or septic processes) and the most favourable results have been obtained with short wave therapy. As a consequence, short wave therapy, today, ranks first among electro-physical healing methods, a fact confirmed by the daily increase in the short wave apparatus put into use, and the large out-put of detailed literature concerned with this field of science.

II. Physical principles.—The therapeutic properties of electricity are due to its power to bring about certain chemical and physical changes in the tissues so as to modify the action of the cells that the defensive forces may be strengthened against the carriers of disease which assail them.

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* Specially contributed to THE ANTISEPTIC.

The currents used in medicine are :—

(1) Direct currents.
(2) Unidirectional interrupted currents.
(3) Alternating currents.
(4) Unidirectional remittent currents.

High frequency current used in short wave therapy come under alternating currents.

A high frequency current is one that periodically reverses the direction of its flow at an exceedingly high rate. A current may be made to reverse its direction any number of times per second, but when the frequency of reversal is sufficiently high the physical properties of the current and its action on living tissues are profoundly altered. The current is no longer able to produce chemical changes in solution of salts, nor is it able to evoke a response from excitable tissues. The frequency of reversal may be called high when the current is unable to produce these chemical changes or to stimulate muscle and nerve to give their customary responses. Consequently its strength and density can be increased to a value high enough to generate heat that can be perceived by the subject and measured by a thermometer. Therefore a high frequency current may be defined as one which alternates at a rate which is high enough to deprive it of its power to stimulate nerve and cause contraction of muscle. It is frequently called an oscillatory current.

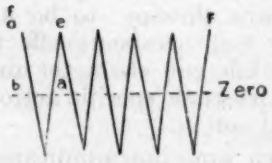


FIG. 1.

One complete period (complete oscillation) is indicated by a, b, c, d, e. Five complete oscillations are indicated.

Suppose a straight line from t' to t' represents 1/100,000th of a second. The duration of each period, therefore, is 1/500,000th of a second and the current is one of a frequency or periodicity of 500,000 per second.

At A and B the oscillation is undamped, whereas at A it is sustained, at B it is unsustained.

Three groups of damped oscillations are represented at C. There is no interval between the end of one group and the beginning of the next. The oscillation, therefore, is sustained although it is damped.

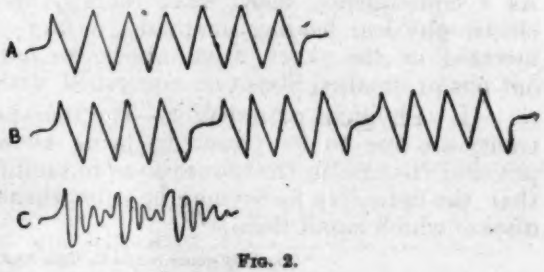


FIG. 2.

The thermionic valve generates undamped oscillations of a strictly determined wave length. As opposed to the thermionic valve the spark-gap supplies damped oscillations on non-hemogeneous (heterogeneous) wave length.

For ages, heat has been one of the most important medical healing factors. Heating of the sick body is the aim and purpose of many methods which are all based on the fact that heat is produced outside the body and introduced into it, in the wellknown way, by hot water, hot air and steam baths, hot compresses, hot air douches etc.

All these applications—considered purely physically—only produce a superficial heating. An appreciable introduction of heat into the inside of the body does not occur.

The heating of the deeply situated organs can only be made with the assistance of diathermy or short wave therapy by means of which heat, as opposed to old processes, is produced inside the body and in the desired depth on the place to be treated. The necessary energy for this is introduced into the body, in the form of electric current.

The high frequency currents used in short wave therapy are applied to the body, not by means of bare contact electrodes as in the case of long wave diathermy, but with the aid of short wave condenser field. The rigid or pliable condenser plates forming the electrodes are insulated and arranged far from the patient's body, so that there is a certain distance between them. The insulating layers and these distances prevent the direct passage of current between the plates, but permit the 'field' to pass, producing a remote action between the two plates. In this way the electric field penetrates the body of the patient, acting on the ions and electrons in the body materials, bringing them into synchronous oscillation, that is to say, producing currents of the same frequency within the body.

Owing to the high frequency of these oscillations the currents produced give rise to no electrolytic nor Faradic effects, but merely produce Joulean heat. The heat generated in the skin is decreased while on the other hand, the depth effect increases.

The specific biological effects produced by short waves in addition to the purely thermal effects are probably due partly to temperature differences arising between certain very small particles of tissue (hence also a secondary thermal effect) and partly to action of a purely electric character. Generally speaking these thermal and specific effects increase both in their intensity and heating effects, in proportion to a reduction in the wave length.

1. *The condenser field* :—The total effect of the electric forces existing between the plates or "the space they pass through is termed "the electric field" or "the condenser field".

Provided the electric energy between the plates or within the patient be not transferred to heat, this condenser field becomes the

starting point (wave centre) of a Hertzian wave radiation, penetrating into space in which it is spread in all directions like water and acoustical waves.

The more short waved the field, the greater is the number of current impulses flowing through the condenser per second, and the greater is the intensity of the current; therefore, the production of powerful physical or biological reactions, is highly facilitated by the generation of the short wave condenser field.

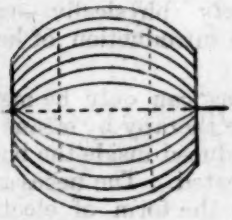


FIG. 3.

The field lines shown in the Fig. 3 are projected in an approximately rectilinear direction only within the axial midpart of the picture.

Further a divergence of the energy lines, a so-called 'energy spreading' is observed, which is particularly exaggerated on the limiting zones of the figure. The amount of spreading depends upon the relation the plate distance bears to the plate surface or diameter respectively.

The depth effect in the condenser field :—Two important practical consequences should be borne in mind for obtaining good depth results.

(*a*) The dimensions of the electrodes must always be as large as possible under the conditions prevailing.

(*b*) The electrodes should not be placed on the body to be treated but arranged far from it at distances of such an extent that only the central homogeneous field zone, as it is limited in Fig. 3 by the dotted lines, can pass through the body. In other words, the field zones near the electrodes, which are characterised by their increased field density, must be outside the body to be treated in order to avoid inadmissible surface heating.

2. *The dielectric* :—In general, layers of insulating material placed between the condenser plates are qualified as "dielectric". Vacuum and glass of a certain quality are loss free dielectrics. All solid and liquid substances of the human body are loss producing dielectrics. Clothes have very differentiated dielectric reaction. Moist stuffs (perspiration) produce great losses and are heated up to a high degree. Therefore it is indicated always to unclothe the body parts to be treated when specially strong depth effects are aimed at.

Schliephake has proved by experiments that selective heating also occurs in very small particles of the human body. The red blood corpuscles are warmed up to a higher degree than the blood serum and certain kinds of cellules are able to reach a higher temperature than others. Certain specific short wave reactions as, for instance, the influence these waves have upon bacteria, at least when *in vitro* are probably due to this selective heating effect or point heating.

This is shown by an experiment in a water receptacle containing living fishes in the short wave field. The fishes, owing to overheating, died a few minutes after having been exposed to the field, whereas the water did not indicate a remarkable rise of temperature. Although we cannot expect in every case an immediate lethal effect on the micro-organisms, their vitality is greatly attenuated. Thus the defence forces of the body become more active.

5. *Wave length and depth effect*:—When a glass trough filled with minced meat is penetrated in the condenser field, thermometers being immersed at both ends and in the centre, so that it is possible to ascertain the temperature rises which take place in the interior and on the surface of the field, determining in such a manner the relation of the temperatures or the relative depth effect, no remarkable differences are indicated when modifying the wave length. But this proportion is fundamentally changed when the thermometer in the midst of the trough is arranged in a glass bottle which is likewise filled with minced meat. If long wave diathermy current is led to the minced meat by means of bare electrodes, no remarkable depth effect is obtained owing to the fact that the diathermy current cannot pass through the non-conductive glass of the bottle. It therefore only surrounds the bottle and no heating effect is exerted upon the minced meat enclosed in the bottle, neglecting the temperature rise originated by the heat conduction through the glass wall, which is of smaller importance. This temperature rise of the minced meat within the glass bottle will increase constantly when currents of continuously decreasing wave length are utilised and advance to the temperature rise obtained in the test carried out without the glass bottle when very short waves are used.

The trough and the bottle are filled with minced meat. The temperature rise of the thermometer placed in the bottle depends on the wave length. This experiment illustrates the observation that human organs surrounded by masses of bad electric conductivity (fat and bones) can be penetrated the more intensively the more the wave length applied is shortened. Hence, in therapeutical practice, all human organs surrounded by masses of bad ohmic conductivity *i.e.*, fat, bones, fascia etc. can be penetrated the more intensively the shorter the

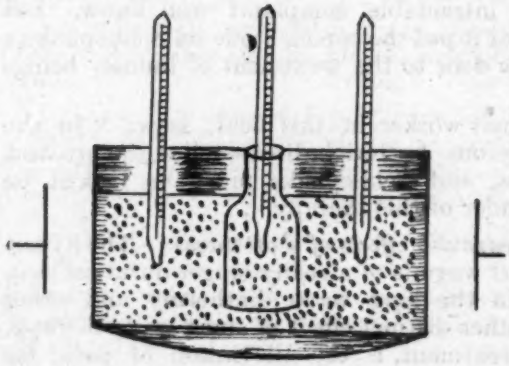


FIG. 4.

wave length employed, and, generally speaking, owing to the special composition of the human body, which consists of several layers of well and poorly conducting substances, the strongest depth effects will be obtained with the shortest waves. The depth effect, therefore, depends on two factors *i.e.*, the electrode distance and the wave length (frequency).

The ordinary diathermy is a current of about 500 to 300 metres and a frequency of oscillation of 1 to 2 million cycles per second.

In short wave therapy wave lengths of 30 to 3 metres and a frequency of 10 to 100 million cycles per second are used.

The effects produced in the body by short wave therapy differ fundamentally from those produced by a diathermy current since the latter follows the lines of least resistance, heating superficial structures such as skin and subcutaneous fat, which offer considerable resistance, while in short wave therapy, on the other hand, skin and fat offer little resistance, and the influence of the field, in the production of heat and other effects, is exercised on deeper structures.

At first it was thought that all the internal effects of short wave therapy were due to heat alone, but Schliephake and other workers have proved conclusively that heat is not the only factor, and heat explains by no means all the consequential benefits.

An experiment conducted by Schliephake upon himself in 1929 marks the moment when short wave therapy entered for the first time into real medical practice. Having tested out his theories by innumerable experiments on animals, in this year Schliephake found himself suffering from a painful nasal furuncle and tried short wave therapy upon his own body. The pain and tension disappeared almost immediately and the furuncle vanished in two days. This was not only a remarkable result in itself, as those who have experience of this painful and intractable complaint well know, but memorable for the fact that it put the coping stone on Schliephake's great work and opened the door to the treatment of human beings by this new therapy.

Liebesny, himself a great worker in this field, says: "In the treatment of acute dangerous bacterial diseases lies the greatest importance of short waves, and Schliephake must be looked on unquestionably as the founder of this therapy".

4. *Biological and therapeutic effects of short waves*:—The hyperæmia produced by the short wave is of a really longer duration than the corresponding effect in the long wave diathermy and other treatment methods. Another distinct effect of short wave therapy, usually found in the first treatment, is the alleviation of pain, far more effective than in long wave diathermy or in any other method of physical therapy. A fundamental difference between short wave therapy and long wave diathermy is the favourable influence the former has upon acute inflammatory and septic processes in which

long wave diathermy is strictly contra-indicated, because it is apt to activate and spread the inflammatory process.

Schliephake also suggests that there is a certain auto-vaccination due to the dead bacteria, while curing furuncles he found that several untreated ones healed simultaneously. Furthermore, there is also probably a direct influence on pyogenic bacteria (staphylococci and streptococci) due to heat effect of more or less subjective character (point heating).

Schliephake has proved that in the short wave field, pus and inflamed tissues are heated up to a higher degree than healing tissues.

He and his co-workers have proved the possibility of killing bacteria in the short wave field by relatively low dosage. This is proved by heating to the same temperature bacteria of the same culture partly in the short wave field and partly in a water bath. The period necessary for the lethal effect on the bacteria in the short wave field only amounted to a fraction of that applied to the water bath. Generally thermal effect predominates with longer waves, while with shorter wave lengths, the so called specific component is largely shown when depth and localising effects have increased simultaneously.

III. Experiences gained in short wave therapy in various diseases.—Ultra short wave therapy is based on the fact that electrical waves of under 20 metres length have a fundamentally different action on the tissues of the body from any other kind of oscillations of the electro-magnetic spectrum.

The considerable shortening in the time required to heal many diseases and the numerous cures of many stubborn ailments of long standing show beyond any doubt that we possess in short wave therapy a very valuable addition to our therapeutic armamentarium.

As previously stated, in many conditions ordinary diathermy is definitely contra-indicated because of the presence of infection and pus.

In about 300 cases of furunculosis the average treatment period was 4 to 5 days. Large carbuncles healed in 10 to 20 days after 8 to 15 treatments. In every case a surgical operation was avoided. In most cases pain and tension were relieved after the first treatment.

Extensive internal suppurations can be cured with operation.

Dental conditions treated by short waves:—Gum boils and other purulent processes are very good indications for short waves, also lymphadenitis, lymphangitis and periodontitis. Pain ceases after the first treatment in many cases. Short wave therapy also prevents pain after extractions.

Purulent conditions of antra and sinuses:—These conditions are very well suited for short wave treatment and it often does away with the necessity for operation. Acute and septic cases react

almost immediately, but chronic cases require more treatment. 10 to 20 sessions.

In this connection the experience of Schliephake is quoted:

"In antral empyema of more than 20 years' duration I succeeded in rendering the patient completely comfortable. The disagreeable odour disappeared generally in from 6 to 10 days, and the incessant use of a handkerchief ceased almost altogether because the secretion of pus was abated. In from 4 to 6 weeks these patients were nearly symptom free. At any rate, the patient can be saved an operation, but it cannot be expected that mucous membrane which has undergone such severe pathological changes as are entailed by years of suppuration should be completely restored to its functional capacity."

In my clinic (St. Raphael's), I had treated few cases of sinusitis and empyema of antrum with success; one was that of a missionary lady who had empyema of antrum on both sides. An ear and throat specialist operated on one side and she was asked to go again after three months for another operation, but she suffered so much pain and discomfort during and after the operation that she decided not to go through another ordeal; she consulted me and I treated her with short wave with complete satisfaction.

Diseases of the upper air passages:—Acute colds can often be completely cured in a day. Symptoms seem to disappear after the first treatment. The same results are obtained in cases of acute laryngitis; septic and chronic laryngitis with chronic catarrh, where every kind of cure at Spas have been tried in vain, have been treated with very good results.

The ear:—Good results have been obtained in the treatment of otosclerosis, ear furuncles, catarrh of Eustachian tubes even in chronic cases of atresia.

Diseases of bones and joints:—Periostitis responds well to short waves. Effusions into the joint that have lasted for years are gradually absorbed. Septic and chronic arthritis is often alleviated very rapidly as regards function of the joint and the general improvement of the patient. Inflammation of the knee joint has often responded so well to one treatment, that actual recovery has taken place. Even in cases of chronic knee joint inflammation with deformity and bony outgrowth, pain can be alleviated and even stopped, and function can be restored. Very good results have been obtained in the treatment of gonococcal arthritis. In the treatment of traumatic joint diseases, due to injuries from sport etc., with bloody and serous effusion into the joint total resorption of effusion, retrogression of the inflammatory process and complete mobility of the joint have been obtained.

A case of chronic arthritis of both knees with great deal of thickening of the fibrous tissues was treated so satisfactorily that

the knees assumed their natural shapes and the measurement round the most prominent part of the knees was reduced by 2½ to 3 inches.

This patient was not able to walk a furlong without much discomfort, whereas after treatment she walked about 12 miles cross country on the hills.

Rheumatic condition :—Treatment of rheumatism shows favourable results, even refractory cases treated sometime for years by other thermal methods with little or no success have been cured by short wave therapy after comparatively few treatments.

Lumbago :—One treatment of 10 to 20 minutes will certainly relieve and in some cases remove all pain and even in severe cases a complete cure can usually be effected.

Sub-acute muscular rheumatism :—Pain and disability very soon disappear. This shows the superiority of short wave treatment to diathermy in the treatment of these tedious rheumatic affections. For a complete cure, however, it is absolutely necessary to consider and remove all sources of focal infection.

Inflammatory conditions of the peripheral nerves :—As a rule acute sciatica reacts best. In chronic cases good results are often achieved by a combination of short wave therapy with medical or possibly other electrical treatment or with ultra-violet radiation. Short wave therapy is, however, much more effectual than diathermy as many cases, that have failed to react to the latter, have cleared up on short wave treatment.

Treatment of neuritis and neuralgia :—This again is more successful if given in the acute stage. Complete relief has been given in the case of neuritis in the arm and leg after about 8 treatments. The same result has been obtained in intercostal pain with involvement of nerve roots.

Diseases of the central nervous system :—General paralysis of the insane : Good results have been obtained by general treatment of the whole body (electro-pyrexia), also by treatment of the skull. This same treatment has succeeded in banishing the lancinating pains of Tabes dorsalis. Schliephake has had success in the treatment of abscesses of the brain and has cured several. One woman was cured of daily epileptic fits from compression of the left ventricle from inflammatory change. The fits completely ceased after 4 weeks' treatment.

Genital organs in the male :—Acute epididymitis is generally curable after a few treatments, alleviation and even complete freedom from pain being rapidly achieved. Acute prostatitis reacts well to short wave therapy.

Abdominal conditions :—According to Schliephake, gastric diseases react well and good results are obtained by the treatment of chronic catarrh of stomach and the colon. Pain of many years'

duration from chronic peritonitis is alleviated and several varieties of liver trouble uninfluenced by any other method of treatment, respond well to treatment in the short wave field. Rapid improvement and recovery may be obtained in cholecystitis.

Chronic dyspepsia of long standing had been treated very successfully with short wave.

On the assumption that most cases of dyspepsia are of the acid type which cause certain amount of erosion of the lining membrane of the stomach, even tiny ulcers, and which maintains its chronic condition, I decided to try short wave. This again led me to the treatment of a case of duodenal ulcer.

In both cases, as a preliminary, counter irritation was applied by ultra-violet radiation on the epigastric region. At times counter irritation to an area of skin clears up mysteries of what lies in the remote depths of the body. This has been constantly observed, but the therapeutic action is still unexplained.

Skin erythema appears about four hours after U. V. irradiation, a maximum reaction results about 48 hrs. later and this erythema may persist for three or even twelve days, with intensive dosage. With still intensity of radiation œdema and blistering are produced; usually from 6-10 skin erythema doses are applied for counter irritation therapy.

The erythema and blistering reaction of the irradiated skin is painful and unfortable, so that the patient has to go to bed. Directly after irradiation adhesive elasto-plast straping is applied to the irradiated skin and the surrounding area. The straping is kept on and left undisturbed for 14 days; it is removed and the irradiated skin is exposed, revealing a reddish brown moist area.

It is necessary to explain emphatically to the patient that the straping must not be disturbed for 14 days.

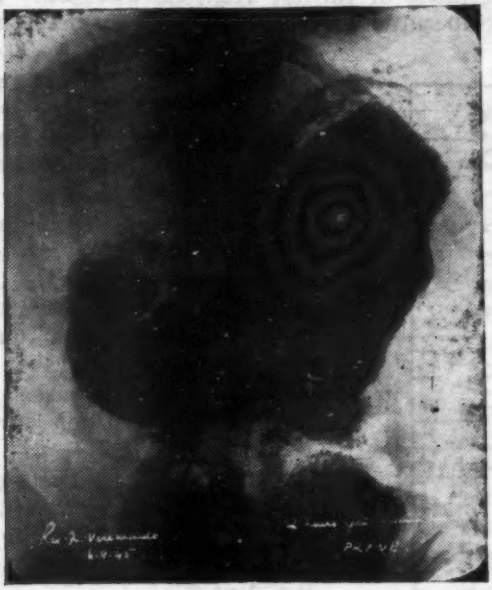
If this skin area is painful, infra red rays can be applied, two or three times a week to this region, the straping being left undisturbed.

Technique of counter-irritation by U.V.R.:—The area of skin for ultra-violet irradiation is mapped out carefully with a dermatograph pencil. The surrounding skin area is protected from the rays of the lamp by crepe paper or towels.

Usually a skin area measuring roughly 12x10 inches is exposed. At a distance of 12 inches between the quartz burner and the skin area, an exposure for 20 minutes equivalent to 10 normal erythema skin doses is applied. This irradiated skin area and the surrounding skin margin extending 1–2 inches is immediately covered by overlapping strips of elasto-plast 2–2½ inches in width.

One of my most spectacular cases was that of a patient with duodenal ulcer treated by counter irritation over the epigastric

region followed by short wave and two courses of general U.V. irradiation.



Rev. Fr. Veremundo, 6-9-'45.
2 hours after barium meal. Prone.

The first radiograph was taken by the radiologist attached to the Government Hospital, Ernakulam, and the second after treatment by the radiologist of the Government Hospital, Ootacamund. They show the change effected after treatment. (*vide X-ray pictures*).

After treatment and a test meal the patient was free from all symptoms and I was able to follow up the case for 3 years.

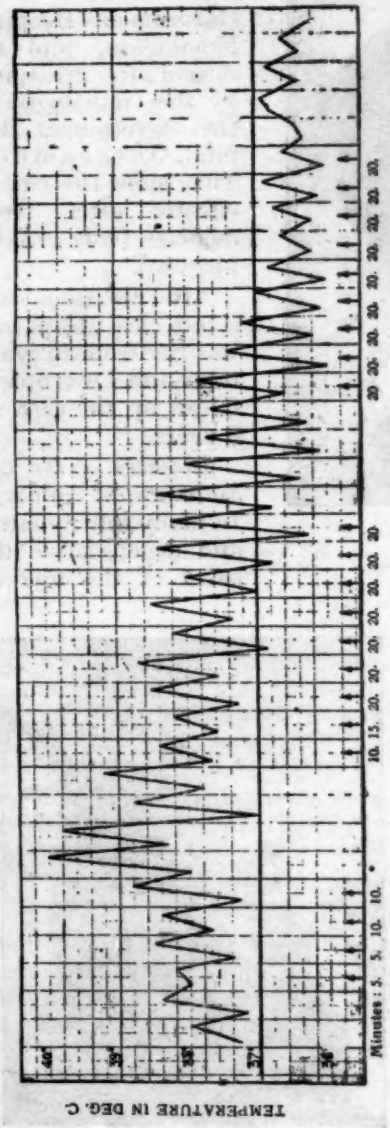
Diseases of the cardio-vascular system:— In many inflammatory and degenerative diseases of the myocardium there has been marked improvement or recovery as shown by electro-cardiograms. Schliephake reports alleviation in angina pectoris with much decreased frequency of attacks.

Diathermy is the quickest and most potent means of influencing the action of the heart, and, unlike drugs, the action is immediate, is entirely under control, and definitely local.

Nagleschmidt considers that every person over the age of 50 years should undergo two or three courses of diathermy to the heart each year as a means of keeping free from heart troubles associated with arterio-sclerotic changes.

Rev. Fr. Veremundo, 3-6-'46.
Immediately after barium meal. Erect.

A radiograph of my chest was taken at the Bernard Institute, Madras, in 1936 and enlargement of the left ventricle was seen. It was the opinion of the Superintendent of the Institute that the hills would kill me in a few years, but it was due to the occasional application of short waves that I was free from all pain and distressing symptoms.



Allergic and endocrine diseases:—Migraine can be treated successfully. Headaches due to angiospasm will disappear after one treatment of 10 minutes.

Some important cases of bronchial asthma are reported.

According to Dousey, diseases of the endocrine system can be cured by general treatment, applying low dosage.

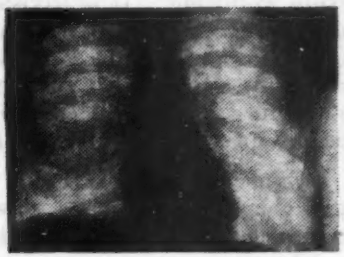
It has been my curious experience, being questioned by some of my patients while undergoing treatment by short wave, especially of rather long duration, whether I was giving them something as a general tonic as they experienced a sense of well-being not felt previously.

Lung diseases:—Schliephake has obtained excellent results in the treatment of purulent diseases of the thorax. He has completely cured a number of patients suffering from severe diseases of pleural empyema which were unaffected by any other form of treatment so that the cases were regarded as hopeless. All his patients suffering from severe empyema after pneumonia were

afebrile and free from symptoms in 3 to 5 days. Dullness cleared up after 2 to 3 weeks and complete cure resulted after an average

TYPICAL CASE OF GANGRENOUS PULMONARY ABSCESS

(1)



(2)

Radiographs taken before, during and after treatment with Short Waves.

(3)

of 3 to 6 weeks of treatment. Complete cures have also resulted in all the cases treated by him of acute and chronic abscesses of the lung of varied ætiology and various usual mixed infections, some complicated with gangrene. In most cases operative interferences can be avoided.

I have treated a few cases of pneumonia in conjunction with Sulfa drugs.

The first subjective and objective symptoms observed were relief of pain and distress and the dropping of temperature to normal in 2 to 3 days.

The above is a case report of pulmonary abscess that appeared in the *British Journal of Physical Medicine*, June 1937, treated in an hospital of the University of Turin, Italy. Radiographs taken before, during and after treatment (*vide X-ray pictures*) and Temperature Chart (*vide page 214*) are given.

"The initial applications (S.W.), were carried out for 5 minutes the succeeding sittings being prolonged to 10, 15 and finally for the rest of treatment, to 20–30 minutes. The period of treatment was divided in cycles of 6–9 days with a daily application; between the cycles there was a period of rest for some days."

The author had experience of many such cases:

The whole duration of treatment was very variable and depended directly on the condition of the patient and the nature of the lesion.

Among the patients I have treated, one was cured after seven applications, generally 30–50 sittings were necessary. After the first application there was almost constantly noticed an increase of objective and subjective symptoms, which frequently ended in severe vomiting. It is advisable to suspend the treatment temporarily for some days if such exacerbations are serious. Vomiting generally signified the commencement of improvement. The first symptom to disappear was pain; continuous fever remained for some time, then remitted slightly and then markedly so, later became intermittent and finally disappeared.

Expectoration is a more persistent symptom; it first loses its fetid character, then its purulent and lastly becomes sero-mucoid and much less in quantity and may last for a long time.

Noteworthy improvement occurs in the general condition from the beginning of the treatment, the weight increases, the appetite is stimulated and in many cases a sense of well-being is easily seen.

Figs. 1, 2, and 3 show the radiograms taken before, during and after the treatment in a case of gangrenous pulmonary abscess, showing the most frequent radiological appearance.

"In a patient, 62 years of age, also affected with diabetes mellitus, who had a gangrenous abscess of the lower lobe of the right lung, cure was complete after 26 applications of the short waves. During the whole treatment the metabolic disturbance was constantly corrected by adequate treatment with insulin and diet.

"In some cases treatment with short waves was associated with intravenous injections of Neosalvarsan, the obvious benefit derived suggests that the combination of Salvarsan and short waves can produce a resolution of the lesion with greater rapidity."

Cases have been reported of syphilis being treated in America, with electro-pyrexia immediately followed by Neosalvarsan and sterilising the patient in a few days, Kahn and Wassermann showing negative results.

A writer in the *British Journal of Physical Medicine* of Nov. 1937 writes:

"One great advantage of the use of inductothermy in the treatment of pneumonia is that there is no disturbance of the patient, no removal of clothing, no pressure of electrodes and, summarised, it may be said that:

(1) Inductothermy has benefited all forms of pneumonia in all stages.

(2) The maximum benefit occurs during the first 48 hours of treatment regardless of the type or stage of the disease or severity of the symptoms.

(3) The relief from dyspnœa, cynosis and from pain takes place during and after the first treatment and is usually confirmed after the second treatment. The fact that patients are without distress in any position in the prone posture is the best evidence of such relief.

(4) It is significant that all cases treated reach a persistent normal temperature in less than 80 hours after the beginning of treatment.

(5) There is no disturbance in the pulse rate as the result of the treatment and improvement occurs coincident with decrease in temperature.

(6) Lastly, the pathological processes clear up coincidently with the crisis, with the early incidence of persistent normal temperature."

Treatment of renal diseases.—Rapid cures have taken place in the treatment of acute and chronic pyelitis. In cases of chronic pyelitis with fever and tendency to relapse the temperature went down rapidly and the purulence became much less, also decrease of leucocytes and bacteria was marked.

I have treated a few cases of cystitis in conjunction with Sulfa drugs with marked success.

While the whole field of indication for ultra short wave length therapy is by no means established there is no doubt about its efficacy in suppurating infections. This is due to the following factors: attenuation of the germs, thermal effect and hyperæmia, favoured, apparently, by a lowered tonus of the sympathetic system, and, lastly increased phagocytosis.

We may agree with the Editor of the *Journal of Physical Medicine* when he writes: "Thus it can be seen that Physical Medicine has achieved a further triumph and a new vista of healing has been opened up."

Certainly, great efforts must still be made, before this conception will enter into the general mind of physicians, and even high placed clinicians consider sometimes physical medicine as a "pis aller," a last trial in lost cases, instead of accepting it as the first treatment when the natural capacity of reaction is still fully present.

"The day will come when all physicians worthy of the name will know their physical methods as they know their drugs."

The Editor of *Archives of Physical Therapy, X-ray, Radium*, August 1934 says:

"High frequency current, according to Bergonie came too soon to a profession too unprepared to appreciate its possibilities. As compared with the laugh that was said to have gone round the world when X-ray presented its reasons for recognition high frequency current was greeted with deathly silence by a world too

ignorant to be anything but hostile to the thesis of its deep thermal properties. Since then it suffered more from over-zealous enthusiasms, than it profited from impartial, intelligent research. It passed through the baptismal experience of a number of appellations until the term diathermy crystallized the action of high frequency current."

Another American writer says: "All medical discoveries undergo a period of trial and criticism until accumulating and overwhelming proof of value captures the citadel of Medical Conservatism."

Toxæmias of Pregnancy; Diabetes in Pregnancy The Early Diagnosis of Uterine Cancer

At the First International Congress of Obstetrics and Gynæcology held in the United States, physicians from all countries of the world were present.

1. A symposium on the *Toxaemias of Pregnancy* was presented. Prof. S. Mitra of India, was of the opinion that environment was a definite ætiological factor and said that in the hot and dry seasons of Calcutta there was an increased incidence of toxæmia which was due at least in part to the concomitant nutritional deficiency during that time of the year. Dr. Kennedy of Scotland said that the main abnormalities found in toxæmia were the increased cardiac output and increased peripheral circulation.

2. Diabetes in pregnancy was discussed by Dr. White of Boston who advocated Stilbœstrol and Proluton for management in addition to a well regulated diabetic diet, insulin, and careful watch over the toxæmia when it develops. From her series of 485 cases, she considered early termination of pregnancy at the thirty-fifth week by cæsarian section desirable. Dr. Given of N.Y. maintained that spontaneous vaginal delivery was permissible if labour was normal and uncomplicated.

3. Prof. T. Antoine of Austria read a most scintillating paper on the surface microscopy of the living. He inserts a modified microscope which magnifies 120 times and contains built-in lighting and a special tubing for the instillation of the dye. He thus is able to differentiate histologically benign from malignant cervical conditions with clear cellular detail *in situ*. He exhibited photographs of cervical cancer lesions which were extremely impressive.

4. In the treatment of cervical cancer, Prof. Navatril of Austria, and Dr. Adler of N.Y., expressed the opinion that in essence, the radical vaginal panhysterectomy was better tolerated, equally extensive, and had a lower incidence of fistula formation than the abdominal approach. In addition Prof. Navaril stressed the extra-peritoneal pelvic lymphadenectomy, while Adler advocated immediate post-operative irradiation. The consensus of opinion was that radiation does not appear to be able to sterilize the lymph nodes in the treatment of corpus cancer.—(A. P. Reporter of *American Practitioner*, Vol. I, No. 7, July 1950).

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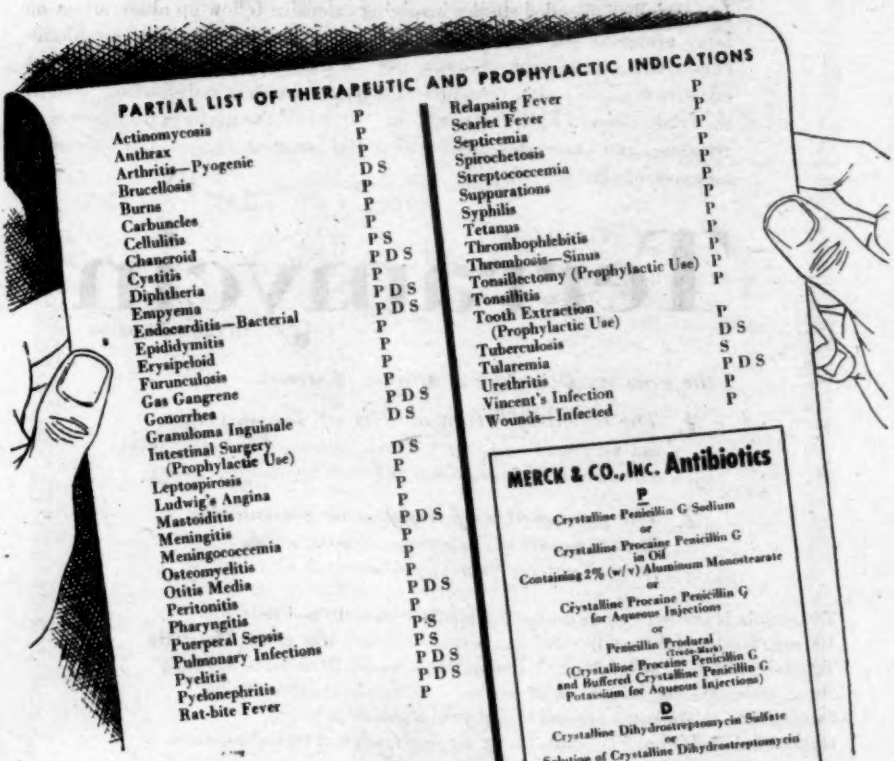

***Above** is a partial list of the many conditions in which these products may be indicated. The symbols D, P, and S are used to designate the antibiotics which are likely to be useful in most cases of the conditions specified. The particular agent to be employed will, of course, depend upon the nature of the disease process and the specific susceptibility of the infecting micro-organism.*

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FERTILITY AND CONTRACEPTION*

RATILAL C. PATEL, L.C.P.S., L.T.M.,
Sinor (Baroda State).

UNDERSTANDING of evolutionary biology of fertilisation and sex function in brief is essential. Basic instinct of self-propagation of species is manifested in reproduction.

(1) Asexual reproduction {fission / budding : fission means division of organism into two or more parts, and each developing into near independent organism, *e.g.*, Ameba, budding means growing from parent-cells *i.e.* yeast.

(2) Sexual reproduction—by union of two organisms or their parts forming zygote {spore-stage / vegetation-stage *e.g.* Algae asexual stage alternating with stage of sexual conjugation—Alternation of generation.

(3) Bisexual or hermaphrodite stage with inbreeding of gametes in same organism *e.g.* hydra.

(4) Unisexual differentiation of organism with ext. fertilisation of gametes in environment *e.g.*, pollination by insects, wind, water in plants and animals.

(5) Internal fertilisation in urogenital sinus and their development of embryo occurs outside, *e.g.* frogs.

(6) Intramaternal development of embryo and placenta formation—so alternation of genital functions, sex act alternating with reproduction—pregnancy and parturition.

(7) Estrous cycle and mating season of sex-activity intermittently *e.g.*, birds.

(8) Rhythmic cyclic periodicity in female with menstruation and continuous sex-impulse from gametes sex invades other parts of body, realm of mind, body chemistry. In cyclic periodicity of ovaries and uterus in relation to ovulation and menses, her whole body and psyche share the rhythm-endometrium, vaginal keratinisation, breast engorgement diurnal temperature variations, cardiac function and B.P., skin glands, metabolism and urinary excretions. As life is in a constant state of flux so as to adapt to changing environment and to prevent degeneration of germ-plasm, sexual reproduction was evolved to allow fresh outside combinations and mutations, functions of sperms on dynamic activation of passive egg-cell or ovum to segmentation and development; and transmission of heredity from father to child. Human cell contains 48 chromosomes of heredity. Gametes-sperm or ovum has 24 in each. So in fertilisation zygote contains normal No. 48 for human species. In mammals sex is determined by chromosomes of sperm; while in birds and

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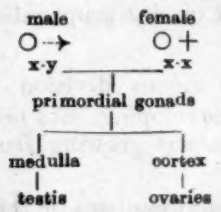
* Specially contributed to THE ANTISEPTIC.

butterflies, it is ovum that decides the sex of the offspring. Mammal-sperms are of two types "x" and "y" while mammalian ova are only one type, "x" only. In fertilisation { X-Sperm + X-Egg = XX-Child-Female / Y-Sperm + X-Egg = XY-Child-Male. Thus sitting on a hermaphrodite the embryo is prepared to move in any direction. In birds male development is basic and non-hormonic, while in mammals female development is basic negative and non-hormonic. Gonads are bisexual and relative strength of cortex or medulla decides sex of gonads. In mammals activities of sex genes are centralised in gonads, while in insects federal system is evolved, so intermediate stage of gonadal hormonic control is absent. In mammals machinery of sex-control is a double-switched mechanism. Chromosomes with genes form the first switch which decides gonads, while the 2nd switch acts by gonadal hormones. It is tempering of second switch *i.e.*, by tumour, T.B. degenerations and other diseases of gonads and gonadotrophic glands, etc. which causes sex reversal, so oft-quoted curiosities in newspapers. In every woman lurks a man and in every man lurks a woman. Thus modern science hasn't so far advanced to control sex determination.



Now coming to the subject proper, the husband and wife might be fertile with different persons but not with each other. There is a certain threshold of fertility below which conception cannot occur. Both parties should be examined by gynæcologist, urologist, endocrinologist and internist. Whenever a man and a woman has lived together for three years indulging in regular coitus without contraception and pregnancy does not occur then it is called sterility.

(1) Primary—absolute-sterility; (2) one child sterility; and (3) Dyskyesis—habitual abortion and child-deaths.

Primary sterility is about 20% due to diseases of pituitary, testis, uterine tubes and anovular cycles. One-child-sterility is due to puerperal pelvic inflammation and venereal diseases. Dyskyesis is due to endocrinopathy or local diseases. 75% sterile marriages are due to totality of multiple infertility factors. In the fertile couple, one or two sterility factors are found, but in the sterile couple the number varies from 2–8 factors. Such are in themselves not important. So remove as many as possible so that fertility level is raised above the threshold value. In 21% husband is at fault. Of these 1/3 male sterility is due to aspermia. In 16% couples no apt cause is found. In 47% fault lies with woman. 15% is one child sterility.

Sterility in male.—(1) Defects of gametogenesis; (2) bad influences on vitality of sperms; (3) obstruction to passage of sperms in male; (4) obstruction to passage of sperms in female genitals; and (5) inimical conditions to sperm vitality in female genitals.

1. Are genital tracts and secretions of accessory sex glands healthy ?

2. Is coitus satisfactory and with reasonable frequency in the fertile phase ?

3. Does semen contain enough number of healthy action sperms ? Like animals some families are fertile and prolific while others tend to die out and single. In future just like blood-grouping there will be semen grouping for compatibility to combat sterility. Fertility varies with age, food and health.

Semen-analysis.—Quantitative and qualitative analysis of condom specimen should be made. When we have to search for sperms the specimen is abnormal. When we see large number of spermatic crystals, it means sperms are dead or absent. Pus cells and leucocytes are abnormal means of inflammation. Blood cells mean hæmorrhage. Large number of abnormal forms mean poor quality of semen. 60 million sperms per c.c. and more than 20% abnormal forms mean male sterility. Amylospermia means concentration of convertible carbohydrate is higher than normal fertile sample—crystalo-spermia-spermin crystals—means pathological necrosis and death of sperms. Teratozoospermia means frequency of abnormal heads. Necrospermia means non-motile sperms. Defective semen is fraught with abortions. Vitamin E defect causes incurable degeneration of seminiferous tubules. Treatment of male sterility lags far behind diagnosis and fertility assay. Apart from semen analysis, examination of fluid by testicular puncture aspiration for sperms are made. Aspermia in testicular aspiration means anti-pituitary defects.

Sterility in female.—1. In 44% there are some defects of sex organs. In 20% sex organs appear normal. In defects of sex organs, anatomical defects of developmental errors and infantilism are commonest due to dietetic errors of avitaminosis and endocrine failures in fetal life to puberty. Other causes are hostile acid viscous cervical secretion, tubal blockage, anovular pseudomenses, cystic ovaries salpingitis, post-partum and venereal infections lead to sterility.

2. Sex organs appear normal :—(*a*) defects in husband, endocervical secretion serologically antagonistic to sperms of husband ; (*b*) In female low B.M.R. chronic toxæmias and diabetes, chronic cholecystitis ; (*c*) more than twice coituses per week and abuse of contraception. Fertile cycles are followed by sterile cycles in the same woman. Almost all women are comparatively irregular. Every woman is a rule to herself. Many women cast more than one ovum in a single monthly cycle, sometimes two or three at 6–10 days interval, so multiovular type. In young girls sometime after the advent of menses, women after delivery for 12–18 months and women approaching menopause generally don't cast ova, so anovular type of menses

cycles. This variation of fertility is more marked in female. She needs general examination of the body, gynæcological examination and functional examination—post coital examination of semen, endometrial biopsy and Rubin's patency of tubal insufflation with kymograph and lipiodal examination by X-ray.

1. Does ovulation occur ?
2. Can ovum pass into uterus ?
3. Does uterine mucosa undergo normal development ?
4. Are endocrine conditions of fertility present ?
5. Does insemination occur aptly in time and manner ?
6. Do sperms pass into cervix ?
7. Are conditions for development of ovum maintained at proper level ?

Don't do D & C, as a general routine. Don't take it for granted that the husband is normal for he has children with previous or present wife, for she might have extramarital relations without the husband's knowledge. If azoospermia in condom specimen perform testicular puncture examination and if sperms are present, it means blockage in male passages, and if no sperms in this test it means defective gametogenesis. Azoospermia in Huhner's test—post-coital finding of sperms from cervix or uterus—means hyperacid or inimical cervical secretion. If living sperms in Huhner's test, it means female passages upto uterus and their conditions favourable.

Contraception and sterilisation.—Contraception or birth-control is a method of preventing pregnancy by interfering with union of male and female gametes, excluding abortions. Pioneers of this movement of birth control and eugenics are Malthus and Sir Francis Galton respectively. By his "Essay on Principles of Population", Malthus gave impetus to the study of many problems. As a keen diagnostician he saw evils of uncontrolled birth-rate, but as a therapeutist he was a clergyman. For serious disease he proposed impossible remedy. In his days not so much was known of sexual pathology and little about effects of sexual repression. He tried to solve the sphinx riddle of reproduction by advising celibacy and later marriages. His ideal was platonic relations. By removing the possibility of unwanted pregnancies, contraception enables woman to plan her family and space her children. It gives greater freedom to women and allows them to follow manly occupations. Average couple shouldn't have more than 3–4 children. Couples should produce children in proportion to their health, wealth and conjugal happiness. In order to preserve the well-being of family, birth control is essential. Too rapid succession of child-bearing destroys health of the mother and leads to premature old age, Sir Francis Galton in his "Hereditary Genius" advised compulsory sterilisation of defectives, lunatics, criminals and sufferers of hereditary diseases. Hanging dread of unwanted pregnancy mars spontaneous freedom,

naturalness, and joy of sex relations of the couple and leads to various nervous breakdowns, aches, and harmful practices during coitus, perversions, and psychic impotence.

Means of contraceptions.—1. *Check pessaries*:—Condom in male, diaphragm, caps, sponge in female. 50% successful. Sex pleasure is reduced in both, but there is safety against venereal infections. It is harmless.

2. *Mechanical irritants to endometrium*:—Graefenburg's ring, stud or pin pessary of gold or rubber.

3. *Chemicals—spermicidal*:—Lozenges, tablets, powders, jellies of Chinosol, Quinine, Boric or Citric Acids. These chemicals are injurious in the long run, leading to chronic inflammation and permanent sterility in female.

4. *Coitus in safe period of menstrual cycle*:—As many women are irregular in ovulation, safe and sterile period are determined by daily Vitamin C test for one month. In marriage complete celibacy is incompatible but relative continence mutually desired by the couple is good.

5. *Sterilisation by vasectomy* in male and salpingectomy in female. Irradiation by X-rays or radium. All these cause permanent sterility.

6. *Biological methods of sterilisation by hormones* are still experimental—sex hormones are ambivalent and bisexual. Inj. Testosterone in female stops ovulation and menses temporarily. Similarly injection of Estrin in male causes temporaray sterility and impotency.

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'Para' and 'Gravida'—Difference Between

Gravida refers to a pregnant woman; the word is used to denote a pregnancy regardless of its duration. Multigravida refers to the number of times a woman has been pregnant not to the number of fœtuses. *Para* refers to the delivery of pregnancies that have continued to the period of viability. A patient is *primipara* when she delivers a fœtus which has been viable regardless of whether the child is dead or alive at birth. If a woman has delivered five children even if two are twins, she is a quintipara. "Delivered by Cæsarean "section" is a commonly accepted term; a mother of 4 children, even if one was delivered by Cæserean section, is still a quadripara.—(*J.A.M.A.*, 142, 7, 523, 1950).

INTRAVENOUS PROCAINE IN SURGERY

A. R. GOVINDA RAO, M.B., B.S., M.S. (Yale),
Professor of Pharmacology, Andhra Medical College, Visakhapatnam.

PROCAINE is not a new drug, but it is only recently that it has been widely used for analgesia by intravenous administration. The enthusiasm that has accompanied this use has its basis in clinical observation. To date, there is no agreement as to how its analgesic action is accomplished. The site of action is not determined experimentally. It is obvious that the more spectacular results have been with the control of pain associated with trauma. Patients with burns, fractures, sprains, and those with pain at the site of surgical manipulations are uniformly benefited from intravenous Procaine. This observation suggested that analgesia follows the extravasation of Procaine through damaged capillaries where it reaches nerve endings in the perivascular areas at the site of injury. The rapid hydrolysis of Procaine is contrary to this concept. It has been suggested, also, that the central effect produced by Procaine was responsible for the analgesia. It has been determined by the Hardy-Wolff-Goodell technique that the pain threshold is elevated in patients, who had received large subcutaneous doses of Procaine, an elevation more prolonged than the duration of local tissue analgesia. Using a similar technique, it was determined in our laboratory that one gram of Procaine given intravenously, as used clinically to control pain, failed to raise the pain threshold as much as a therapeutic dose of Aspirin (Acetyl-Salicylic Acid). This is not in keeping with the analgesic action observed and throws doubt on the importance of the pain threshold as a modality for evaluating analgesic drugs, or points to another mechanism to explain the results with Procaine.

Brodie and his associates devised chemical methods for identification of the products of hydrolysis, Diethyl-amino-ethnol, and Para-amino-benzoic Acid. With these procedures it was demonstrated that, in man, Procaine was rapidly hydrolysed to the alcohol and acid after intravenous injection. They learned further that urinary excretion of injected Procaine is negligible, but that 75 to 95 per cent of the predicted PABA (Para-amino-benzoic Acid) injected in Procaine is excreted unaltered in urine. This is in contrast to the 20 to 35 per cent of the predicted amount of Diethyl-amino-ethnol which could be isolated from urine.

It was obvious then, that the Diethyl-amino-ethnol product of hydrolysis of Procaine is further metabolised *in vivo* in a manner not yet determined. This, and the fact that Procaine persists in plasma for a much shorter time than Diethyl-amino-ethnol, suggests

that the latter drug may be the pharmacologically active agent rather than the parent drug.

It was logical, then, to prepare Diethyl-amino-ethnol for oral, intramuscular, and intravenous use, and study its toxicological and pharmacological action. Emphasis was given to experiments leading to an evaluation of its possible analgesic effects. Such a study is now in progress in New York University College of Medicine and Belleevue Hospital. Initially it is being used to control post-operative pain.

Diethyl-amino-ethnol produces no obvious toxic effects in man even when large doses are given. This is in sharp contrast to Procaine, where the most serious criticism of its use intravenously is the frequency of toxic reactions. Also there are some definite indications that Diethyl-amino-ethnol is effective as an analgesic when given orally or intramuscularly. The experiments with this drug so far completed are still in the experimental stage and further research in this field is sure to be fruitful.

No toxic symptoms have been noted following the administration of 4 grams of Diethyl-amino-ethnol by intravenous infusions during operations. The analgesic effects appear to surpass those observed with Procaine. The results obtained with Diethyl-amino-ethnol, especially because of its relative absence of toxicity, make it mandatory to complete further studies.

UNUSUAL SYMPTOMS DUE TO STREPTOMYCIN

M. ABDULLA, L.C.P.S., L.M.S., P.C.P.S.,
AND
D. K. ROHINI, L.M.P., L.C.O.,
The Nursing Home, Vaniyambadi, N. Arcot Dist., S. India.

VARIOUS toxic symptoms due to Streptomycin have, from time to time, been reported. Many a pen has added to the huge pile of information. This, one more, may be pardoned.

The symptoms exhibited by the patient reported hereunder are of such unique type that they are worthy of record.

Case report.—Mr. K. A. S., a tanner, aged about 35, was suffering from vague abdominal pains for about 4 years. The pains were of such a diverse nature that it was difficult for one to arrive at a definite conclusion. Chronic gastritis, cholecystitis, gastro-duodenal ulcer and appendicitis were considered as "Probables", not to mention neurasthenia and hypochondriasis. He was drugged with various preparations of barbiturates and hypnotics. With all the excellent care and treatment, the patient went down-hill, lost his appetite, weight and sleep.

Laboratories failed to furnish any clue and account for his ailment. His stools, blood, sputum, urine and gastric contents were examined on several occasions and found normal; X-ray photographs of his lungs and heart, Barium-meal examinations of the stomach and intestines revealed nothing abnormal.

His past history was medically unblemished and noncontributory. He did not suffer from piles, dysentery, gall-stones and syphilis, at any one time. Neither he had typhoid and tuberculosis in his family.

Finally, an exploratory laparotomy was performed about 9 months ago and an innocent appendix removed. The pain in the abdomen continued as before and became worse later on.

On 1-12-1950 he developed diarrhœa which persisted for about a week in spite of the best medical treatment. His motions, 6 to 15 per day, were loose, watery and copious; pale yellow in colour and without any foul odour, mucus and blood. On 11-12-'50 he developed hiccough which was persistent and not amenable to treatment. It was at this stage of his disease he came for treatment.

Tuberculosis of the intestines? It appeared to be more than a probability. The chronic nature of the disease, the vague pains in the abdomen, loss of weight and appetite, unaccountable diarrhœa, negative reports from both the laboratory and X-ray units, were definite "pointers" to tuberculosis. Without obtaining any further auxiliary assistance from a laboratory, Dihydro-Streptomycin Sulphate was administered; 1 gramme per day divided into 2 doses and given at 12 hours interval.

After 14 grammes of Streptomycin were given the patient complained of giddiness and weakness, to which we did not pay much attention and put it down to his general weakness and poor diet which he had been having for some days. The injections were continued for 3 more days. On the 4th day we found him really bad. He could not stand and walk steadily. Streptomycin was suspended.

The next morning, I (M.A.) was hastily summoned to see the patient. He was looking pale, worried and anxious; complained of palpitation of the heart and pain in the chest. His temperature was 97·2°F.; pulse 130 and of low volume; respiration 20 per minute. Blood pressure, most unfortunately, was not taken.

He had violent tremors of both the upper and lower extremities, —more marked in the legs, which increased and became more apparent when the limbs were moved. The knee jerks, ankle clonus, and knee clonus were absent but the tactile sensations were present. He had no cephalalgia, nystagmus, tinnitus and his eye-sight and hearing were normal.

Under complete rest and heavy doses of Nicotinic Acid he improved wonderfully and by the next morning he was about normal, excepting his weakness which lasted for some more days.

Discussion.—The giddiness and tremors were definitely due to the Streptomycin. They stopped with the cessation of the drug. They could not have been due to his weakness, hysteria or neurasthenia. The medical dictionary, most unfortunately, is still replete with certain words and terminology conveniently coined by us in order to cover up our profound ignorance. Neurasthenia is one of them.

Tuberculosis of the intestines, in the early stages of the disease, could be overlooked and mixed up with a number of diseases and conditions of the intestines, such as enteritis, colitis—due to any cause, sprue and amœbiasis. The signs and symptoms are so vague that they easily baffle the ingenuity and keen observation of one.

It is more than likely that continuation of Streptomycin beyond the stage of vertigo, severely affects the nervous system.

Manifestation of such severe toxic phenomenon with 17 grammes of Dihydro-Streptomycin Sulphate is so far unknown.

Summary.—1. A case of Tuberculosis is reported.

2. Unusual symptoms affecting the nervous system are recorded.

A CASE OF NEGLECTED SHOULDER PRESENTATION WITH PROLAPSE OF THE CORD

Dr. S. C. MATHUR,
Medical Officer, I/c., Kherwara Hospital,
P.O. Kherwara, via Udaipur, Rajasthan.

SHOULDER presentation is one of the rarer of all abnormal presentations. The outlook of prognosis is graver than in any other presentation. The earlier the condition is recognised, the speedier the lie remedied, the better is the prognosis.

I was called by the midwife on duty to examine a case of prolapse of the cord, which had been brought to the hospital for delivery at 2-30 p.m. on 18th December 1950. The female had been in labour for more than 12 hours, and the child was dead. The age of the patient was 26 years and the present one was her 4th delivery. Labour had been normal in her previous deliveries. The labour pains were very feeble. The patient was taken on the table and I directly started my examination. Then she began to shiver and there was a rise in her temperature. This was perhaps brought about by malarial attack. On examination I not only found out the prolapse of the cord, but also a round mass of the size of cricket ball bulging out of the vagina. I thought it to be the head of the fœtus, but by observation and palpation I concluded that it was not the head. Introducing my hand to locate other parts I could feel the chest. I pulled out the hand of the fœtus to see whether the round mass was shoulder or not, the child having been dead and

as a result my diagnosis was confirmed. Under anæsthesia, after clearing up the rectum and the bladder, I tried internal podalic version but failed. It is difficult to perform version in such cases, and should injudicious efforts be made there is a danger of rupturing the uterus. The head and shoulder of the fœtus are generally firmly wedged under pelvic brim, but in this particular case the shoulder was so much swollen that it was difficult to introduce it. Many books have laid undue stress on this point of rupture and have given exaggerated impressions of the danger of version, in any case in which the patient had been in labour for more than 12 hours with membranes ruptured, but actually it is not so. Nearly 3 years ago I came across a case of prolapse hand where the female had been in labour for a pretty long time and the child was dead almost 6 hours back. I did internal version successfully and brought down the leg and delivered the fœtus. The mother made uneventful recovery under ordinary treatment.

The only solution when version has failed under such circumstances, was to perform decapitation. The instruments were ready at hand. But this method is dangerous because, if not handled carefully, the uterus may be injured. Moreover, in this particular case the shoulder was so much swollen that there was not sufficient space left to pass the hand and the decapitation saw, after fixing the head. I therefore decided to deliver the fœtus by spontaneous evolution, and should this method fail, to perform evisceration or spondylotomy. The position of the lie was dorso-anterior. 1 c.c. of Pictocin was injected I.M., two fingers of each hand were introduced into the vagina and the chest of the fœtus was pressed to do acute lateral flexion and of cervical and upper dorsal spine, the ribs distended the perineum and the breech forced in the hollow of the sacrum. The part of the thorax and shoulder already having escaped, the breech and legs then followed. The other hand which was impacted under symphysis pubis was dislodged by giving the rotation to fœtus. I introduced my hand into the vagina and the extended hand of fœtus was brought out. The after-coming head was removed by jaw flexion and shoulder traction method without any difficulty. The placenta was also removed by hand. After delivery she had a temperature of 103°F. which in my opinion, was purely due to malaria as corroborated by the symptom of shivering in my presence at the time of inspection. Still I injected 2½ lac units Penicillin straightaway and gave ½ lac units Peniciliin every six hours for the next 48 hours. The temperature touched normal on the third day. She was placed on Ergot Quinine mixture. On the fourth day everything being normal, her husband removed her to his house. She is very well and fit now.

Points of interest.—1. I have never seen a big round swollen shoulder, which may perfectly resemble head. I think the presenting part was congested due to pressure of the uterine contraction

for a long time. It became swollen and foul smelling due to the death of the child.

(2) Spontaneous evolution method is worth trial in the cases where pelvis is roomy, before doing decapitation, which is dangerous and requires very great care and skill born of long professional practice. Formerly I used to entertain the belief that this method is possible of employment only in cases where the fœtus is abnormally small but in this case the fœtus was quite normal.

A CASE OF CHRONIC ULCER

M. D. BAPAT, L.M.P. (C.P.),
Medical Practitioner, Barnagar (M.B.), Dist. Ujjain.

ONE man, aged 30 years, came to me for medical advice. His history was as follows:—

Complaint:—Ulcer on the left leg.....18 months.

In the beginning he got one very small wound on the left leg, on its medial aspect, the cause of the wound being unknown to him. Later on, the wound increased, thereby irritating him. He tried his own remedies and finding no improvement he started consulting local *vaidyas*. Finding no satisfactory improvement, he later on started Allopathic treatment, during which blood and urine examinations were also done. Sugar being present in urine "Insulin" treatment was advised and local treatment of the wound was carried on with no benefit. So he left the treatment and allowed the wound for Nature to cure.

Past history:—N.P., denied V.D.

Family history:—Wife and children—all well.

Examination:—(1) General:—N.P. except few brownish scars on the body. (2) Chest:—N.P. (3) Abdomen:—N. P. Spleen—nil. Liver—nil. (4) The wound proper:—The bandage was opened and the wound was cleaned. Length and breadth—1½"×1". Covered with stuff. Surrounding area brownish. The exact type of the ulcer could not be judged as it was handled by various hands. (5) Special examination:—Was done during his past treatment. (*a*) Blood—N.P.; W.R.—not done. (*b*) Urine—as usual. Sugar+2%.

TREATMENT:—Taking into consideration the brownish scars on his body and the look of the wound, I thought of anti-syphilitic treatment. As the treatment was different from the one that he had so far received, he readily agreed to be under my treatment:—

℞	Pot. Iodide	...	gr. xv
	Liq. Hydrargyri Perchlor	...	℥ vii
	Syr. Simplex	...	℥p
	Aqua ad	...	℥i
	Mft. mist.	...	℥iii ℥i T.D.S.

℞ Penicillin G (Glaxo) I.M. 1 lac in morning and one lac in the evening—daily.

℞ Thiosarmine (Brahmachari Lab). 1st I.M. Inj.—·3 g.m. 2nd I.M. Inj.—·45 gm. on the third day, followed by ·6 gm. on every third day.

℞ Spiroids (C.D.C.) Tab.: II tabs. t.d.s. after meal with cold water.

Local treatment:—Wound was cleaned with spirit and dressed with Cibazol (Ciba) powder only. (No Insulin was advised and that idea was postponed).

After 15 days I found the ulcer improving and so the treatment was carried on.

Penicillin after 30 lacs was discontinued. After one month the ulcer healed up completely. Later on my attention was drawn towards the old urine reports,

and so I advised him to get his urine examined again for sugar and percentage. When I got the new report I was surprised to note that no sugar was reported. My anti-syphilitic treatment probably cured the diabetes also!

May I know the reason through this Journal?

Conclusion:—I think particularly in this case probably syphilis might have influenced the pancreas (the islets) and thereby given rise to the diabetes. As the syphilis got cured the islets might have recovered and hence the diabetes disappeared.

Near Cinema House, Barnagar,
(Madhya Bharat).

ANTI-HISTAMINE DRUGS IN CONVULSIONS OF CHILDREN

RATANLAL N. GANDHI, L.C.P. & S.,
Chhipwad-Sankheda, Dist. Baroda.

A FEMALE child, aged 3 months, had attacks of convulsions. She was treated by a *vaidya* without any improvement. When I was called to see the patient the following conditions were noticed:

Complaints:—Convulsions for the last 8 days.

Family history:—One brother and one sister died in childhood by similar convulsions. Three brothers and two sisters are all healthy. Parents are healthy.

Previous illness:—There were no birth injuries, no congenital defects of head. Child was healthy before this illness.

Present illness:—The child gets attacks of convulsions. At the end of each convulsion, she becomes drowsy, and, before she gets consciousness, she gets another attack of convulsion. The duration of each convulsion is 10 to 30 minutes or more.

Physical examination:—Temperature 97·5°F (armpit); Pulse—120 p.m.; Respirations not counted due to convulsion but they were not rapid. She is well built and healthy. Abdomen is not protruded and tympanic. Spleen is just palpable; liver not palpable. She has passed two normal stools. Respiratory system is normal. No adventitious sounds are heard. Breathing is normal vesicular. Heart sounds are normal. Pupillary reflexes are normal. Plantar reflex is flexer. Knee and ankle jerks were difficult to elicit. There are no signs of paralysis. Laboratory examinations were not done due to lack of facilities.

Diagnosis and differential diagnosis:—As the history and examination suggested nothing it was difficult to arrive at a diagnosis. A provisional diagnosis of intestinal helminthiasis and malaria were first thought of, as they are common in villages.

As there was no temperature or other signs, encephalitis, meningitis, broncho-pneumonia, tonsillitis, pyelitis, influenza, acute infectious fevers, were out of question.

There was no history of difficult labour. So birth injuries, cerebral hæmorrhage were not thought of.

Tetany, tetanus, mumps, uræmia, hypoglycæmia were the rare conditions to be met with, but there were no signs and symptoms present to suggest them.

TREATMENT:—(1) Benadryl (P & D) 1/4 cap t.d.s.

(2)	Euquinine	... gr. i
	Calcium Lactate	... gr. ii
(3)	Soda Citras	... gr. iii
	Soda Bicarb	... gr. iii
	Chloral Hydras	... gr. i
	Pot. Bromide	... gr. i
	Tr. Hyosciamus	... ℥ v
	Syp. Auranti	... ℥ x
	Aqua Chlor	... ℥i

(4) Santonin with Hydrargyri Cum Creta gr. i each were given at night for 2 days.

(5) Penicillin 50,000 units injections were given on the fourth day.

With this treatment there was no improvement and the condition of the patient beame serious.

She was given Antistine tab. 1/4 and Phenobarbitone Sodium gr. 1/3 Mft., t.d.s

Convulsions were controlled on the fifth day but she remained listless and drowsy.

On the sixth day, the above powder was given twice a day, the condition of the patient became somewhat better.

The powders were given for 8 days more, there was no convulsion and the patient improved thereafter.

Discussion.—Dr. L. K. Rama Rao has mentioned allergy as an acting agent in convulsion of children in some cases in the ANTISEPTIC of October 1950. In this case, though Antistine (with Phenobarbitone) has acted and controlled the convulsions, but Benadryl, the anti-histamine drug, has failed to prevent the convulsion. So the cause for convulsions in children requires further investigation. Had it been allergy. in this case both the anti-histamine drugs—Benadryl and Antistine—would have controlled the convulsions, but Benadryl failed to check the convulsions.

A CASE OF PERSISTENT NEURALGIA

K. NARAIN RAO, L.M.P.,

Asst. Medical Officer, Mysore Medical Service, P.O. Kengeri, Bangalore District.

PATIENT, N., male, aged about 12 years, coming from an average middle class family, rather sparingly built, slightly anæmic and run-down.

Previous history.—About 3 years ago, the boy started complaining of severe head-ache involving the whole head in general, but the actual *pain* was referred on to the frontal region in particular ; the boy was in very good health then, and there were no other concomitant signs or symptoms associated with the headache ; as is usual, the local doctor was consulted, who did all that he could for about 3 months continuously, but, most unfortunately for the boy, and to the utter disappointment of the poor parents and the doctor as well, there was no improvement at all ; then, the anxious parents naturally thought of consulting "specialists," (for, I do not know if there are any for neuralgias in our country) and they did consult, and they advised the parents to get the boy's eyes tested; even that was done, and glasses were prescribed for correcting a "short sight", but the neuralgia continued ; back they came to the specialist in a General Hospital, who admitted the boy to the hospital for observation, examination and treatment. The usual routine examinations were done with negative results including a radiogram of the skull to find out any pressing tumours ; during the period of his stay in the hospital, the boy was treated empirically with Vitamin B, Liver Extract Cibalgin, Luminol, Aspirin etc. but the poor anxious parents were disappointed to find that the boy did not progress at all towards improvement, much to the dismay and disappointment of the specialist ; consequently, the boy was discharged after about a month with instructions to consult the mental specialist as the boy had by then become rather cranky, irritable and desperately violent at times, though rarely. At this stage, one can easily imagine the psychology of the poor parents as well ; most unfortunately, they did not think of consulting the mental specialists merely on grounds of sentimental objections. Then came the turn of grannys who advised Ayurvedic treatment and "*mantrams*" which were also tried for about 2 months but with no relief whatever ; the parents naturally became desperate, and at this stage a wandering "Yogi" (?) was sighted by mere chance

who advised by looking into the stars, a pilgrimage to Rameswaram. At this critical juncture, the father of the boy was transferred to my place, and out of sheer curiosity he came to me one day and said "Sir, I have got a son who is suffering from neuralgia for the last 3 years, and I have tried all doctors including specialists, *vaidyas*, and *mantrams* etc., but found no relief; now, since I have been transferred to this place, before going on a pilgrimage, I want to "TRY YOU" and be done with it; can you kindly take up the case and do your best? On hearing all the story of specialists etc., I felt rather very reluctant to handle the case, thinking that I would be nowhere between the specialists on the one hand, and *vaidyas* and *mantrams* on the other. But, my curiosity to try the case overpowered my professional ability and I did say "YES" to the father, definitely telling him to allow me to have my own way in the treatment without any restrictions as to the time that I would take etc. I took up the case.

Physical examination.—A thorough detailed physical examination of all the systems was done to the best of my ability with the result "N.A.D" (Nothing abnormal detected), but, clinically he was found to be slightly anæmic and a bit "run-down"; mentally, he was a little over-productive and at times hyperactive which at times lead on to a little violence also.

TREATMENT.—After all my examination and with N.A.D. uppermost in my mind, I found myself between the devil and the deep sea as regards treatment. I could not proceed nor could I decide upon any scientific line of treatment as every available stuff had already been tried and given up. Anyway, I thought that an empirical line combined with a psychological approach was the best one under the circumstances; so, I straightaway pitched upon "Intensive Calcium" and "Vitamin B (Complex)" therapy, and started pricking him alternatively at intervals of 3 days: the stuffs that I used were Colloidal Calcium with Ostelin Vitamin D (Glaxo) 2 cc. and "B. Complex" T.C.F. 2 cc.: My psychological approach was to sit with the patient everyday for about half an hour and talk to him on various subjects that would interest him: in all, I gave him 48 injections of each, at the end of which, to my intense surprise, the patient told me one fine morning that he had no headache. I could not believe him, but it was true: he never complained of the headache even though I used to persistently question him; further on, I gave him 12 more injections of each and stopped. Thereafter, I started giving him orally "Kepler's Malt Ext. with Cod-Liver-Oil" (B.W's). During the treatment, he was asked to take ordinary home food with more of milk and some fruits as and when they were available in this small place. After 3 months, the boy did not complain of any headache and this improvement continued on even after 6 months which was indeed marvellous from my standpoint: at the end of 9 months still there was no headache, and, thank God, the boy appeared for Middle School Examination and passed in first class. Even after 12 months, I hear that the boy is getting on alright.

Now, so far as this case is concerned, I want to ascertain certain points from my learned professional brethren, who, I am sure, will enlighten me. In this connection, I humbly beg to submit to the profession in general and to specialists in particular, that I being at the lowest step of the ladder in the profession, do not profess to know much, nor do I mean to decry the value of specialists and their treatment, but a casual mention was made just to complete the story. That is all. If they think that I have in any way gone beyond my jurisdiction, I beg of them their kind pardon.

Points for consideration.—1. What was the cause of the "headache" in this particular case? I mean the pathology.

2. Is it the intensive Calcium or Vitamin B or both that brought on the relief? or

3. Is it the psychology behind it? or

4. Is it mere faith?

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THE STOCK-TAKING

THE anniversary of our Republic affords one the most valuable opportunity to take stock of the achievements of the past and to plan for the future. The Hon'ble the Health Minister has availed herself of this golden opportunity to catalogue the achievements so far and to explain how much more yet remains to be done, if the nation is to attain parity with the other advanced countries in the world. Starting on the premise that " the health of the nation is in fact its greatest wealth " and that "there can be no happiness or contentment for any individual or a group or a country if they are always ailing or in danger of falling easy victims to disease," she explained how many opportunities that came in the way of the country in the past had been missed : "It is a real tragedy that very little attention has been paid to the nation's health in the past. When there was ample money to train personnel and expand health services, build hospitals and sanatoria, concentrate on housing and environmental hygiene, health education and all that pertain both to the curative and preventive side of the disease, a very meagre portion of the revenues was devoted to health. The rural population which constituted the real India was wholly neglected and even in the cities the facilities afforded to the poor were not such as to inspire confidence in the patient or cater adequately to the general need." The charge is, of course, very well-founded and we have ourselves had repeatedly to draw pointed attention to the gross neglect of this elementary function by the State. We can give proof to sustain this charge from the history of our own Province. In the early twenties, the Provincial exchequer was full to the brim and overflowing too, and if only the then Government had

spent at least a part of this over-flowing money for the improvement of public health and sanitation as they should have done and as they were requested to do, we would certainly have a very different picture at present. But, unfortunately, for reasons of their own, the then administrators allowed all these moneys to be overflowing from their coffers that the Government of India, through the Meston Award, snatched away a very large slice of it, *i.e.*, 348 lakhs every year by way of Provincial Contribution. The same was the case with many other Provinces also which had shown a similar miserly attitude towards the needs of the people. And all these moneys were frittered away by the Central Government in increasing the emoluments of the highly pampered superior services, extension of so-called strategetic railway lines in the N.W.F. Province, and so on and so forth. But it is no use crying over spilt milk. We have to take things as they were handed over to us and see how far we have progressed and how much yet remains to be done.

The tabular statement furnished by the Hon'ble the Health Minister in order to convey an idea of the expenditure per capita on health development programmes since India achieved independence, for the financial years 1946–'47 and 1948–'49, is revealing :

	1946–'47	1948–'49
	Rs. A. P.	Rs. A. P.
Coorg ..	1 6 0	3 0 0
Madras ..	0 9 5	0 11 2
Bombay ..	0 14 11	1 6 9
West Bengal ..	0 11 2	0 12 2
Uttar Pradesh ..	0 4 10	0 7 1
East Punjab ..	0 7 0	0 8 5
Bihar ..	0 5 0	0 6 3
C.P. and Berar ..	0 3 10	0 5 11
Assam ..	0 6 5	0 9 1
Orissa ..	0 6 5	0 12 3
Average ..	0 8 3	0 10-11

While it is a matter for some satisfaction that at least within three years the per capita expenditure on health development has increased to a certain extent, we have to consider how it compares with the amount spent in other countries on this head. Let us leave aside such highly advanced and financially strong countries like the U.S.A. and the United Kingdom and compare the per capita expenditure with that of our neighbouring country, Ceylon. That country is spending Rs. 8 to Rs. 9 per head on health alone. While there may be no comparison between India and Ceylon from the point of view of either size or of population, it cannot be said that what had been possible in Ceylon should be impossible in India, provided the will was there. The figures given by the Health Minister herself show how much leeway India has to make if she is to attain parity at least with her neighbouring country.

We are quite prepared to grant that because of the realisation on the part of those in charge of the Government that the health of the people cannot be allowed to deteriorate, something has been done which, if fairly viewed, might probably show a more steady advance in the course of three years than over a preceding period of many more years and that too in the face of great troubles and turmoil. But what little improvement has been made falls considerably short of the immediate and urgent needs of the situation. The Health Minister says that when they have practical proposals which they would like to undertake, "they are handicapped by a financial stringency which not only forbids any development but which makes it hard for the Health Ministries both at the Centre and in the States even to continue to serve the cause of health even on their present meagre footing!" *et tu Brute*! The wealth, well-being and prosperity of a nation depend very largely on the health of the people. It is only when the people are healthy, happy and contented, they can improve the wealth of the nation by increasing production all round and make the country not only self-sufficient in the matter of its own absolute minimum requirements but also export something abroad to meet the cost of its imports. If the health of the people is to be allowed to remain static or deteriorate owing to financial stringency, the wealth and productive capacity of the people would naturally go down, further affecting the financial position of the country. If the country is to advance, if the wealth and prosperity of the nation are to be increased, this vicious circle should be broken and a great, very great, step forward in the improvement of public health has to be taken. We trust this aspect of the matter would receive the earnest attention of the Governments and steps taken on a large scale to improve public health.

While, under the Constitution now in force, the States are autonomous in respect of Medical Relief and Public Health, a close liaison has to be maintained between the Centre and the States so that a co-ordinated policy can be followed throughout the country. For this purpose the Central Ministry of Health can and should maintain a degree of influence in the matter of improvement of health administration throughout the country to the extent that it can initiate enquiry, discussion and experiment and to the extent to which it comes to be looked upon by the State administrations, the professional and the lay public, as an organisation which is competent to advise and assist in the practical solution of health problems. In this sense the functions of the Central Ministry of Health which have been summarised by the Hon'ble Minister in her review are fairly comprehensive to cover all matters of common interest. But the success of any effort on the part of the Central Health Ministry is dependent on the wholehearted support and co-operation extended to it by the States. The States by themselves cannot do much individually and we hope that the co-operation so far forthcoming would be made available to

the Centre in an ever-increasing measure in the years to come so that a uniform policy of development can be adopted throughout the country.

We are glad that the need for increased medical personnel has been recognised by the Governments of the States and increasing attention is paid to this matter. In addition to the up-grading of certain Medical Colleges in the country with a view to provide post-graduate training, some of the States *viz.*, Bombay, Madras and Bihar have increased the number of yearly admissions to their Medical Colleges. The Governments of West Bengal and Uttar Pradesh have introduced the double shift system to enable more students to qualify themselves. While all these are no doubt improvements in the past position, the present lack of personnel can be got over only by the establishment of more and more Medical Colleges all over the country. We are glad that the question of the revision of the syllabus of the medical course is to come up for consideration early before the appropriate authority, and we trust the matter will be gone into in all its aspects and a proper decision arrived at.

It is true, as the Health Minister has pointed out, that the promotion of public health is a long lane that has no turning. But even that long lane has to be traversed if India is to attain the status which is legitimately her due. India's collaboration with WHO and UNICEF has greatly benefited her. Let this collaboration be sought and obtained in other aspects also not only in the interests of India but also in the interests of the world as well.

THE TUBERCULOSIS PROBLEM

DR. K. S. RAY'S unfortunate and premature passing away deprived the tuberculosis workers who assembled in Conference at Hyderabad on February 5, 1951, of the valuable suggestions he might have put forward to help prevent the spread of the scourge, but his place was worthily filled by Dr. K. VASUDEVA RAO, formerly Superintendent of the Tuberculosis Sanatorium, Madras, and at present Deputy Surgeon-General, with the Government of Madras. He has brought to bear in his address an analytical mind, his long and wide experience in the field, and the large volume of information available from periodical reports and other publications on the subject and given the greatest importance to both the preventive and curative aspects to be attended to if any tangible reduction in the mortality from this disease is to be brought about.

As he pointed, out, the problem of tuberculosis is a vast one. The radiography surveys carried out in the United States of America, where living and environmental conditions are fairly satisfactory and the standard of living is high, have demonstrated that

there are approximately ten active cases for each death occurring from this disease. In India, where housing and environmental conditions are, to say the least, deplorable, and the standard of living very, very low, this proportion must naturally be much higher. But even assuming, in the absence of reliable statistical data, that the proportion in India is the same as in the United States, for about a million known deaths from tuberculosis, there must be at least ten million people suffering from active disease, out of which at least about 50% or more must be in an infectious state. And it has also to be remembered that the incidence and mortality are heaviest between the ages of 18 and 35, when they are about to enter life after education, or are in the prime of life, responsible for maintaining their families.

But what are the facilities available in the country for the treatment of these people? All told there were only 7,295 beds all over the country at the end of 1949; 520 beds have since been added; and we are left with only 7,815 beds in all. The cost of maintaining a bed being Rs. 8,000 a year, it is next to impossible for the State to find this colossal sum of 800 crores for this one disease alone. Even in well advanced countries, the expenditure on tuberculosis is not borne entirely by the State. In Switzerland the Government contributes 15%; in Greece 20·25%; and in the U.S.A., according to the President, at least 50 times more per head is spent than what it is in India. Even if we are to follow the Switzerland proportion, the Governments in this country would have to contribute 120 crores a year. This is next to impossible, and we have therefore to attach the greatest importance to the preventive aspect, at least to avoid the contacts catching the infection.

Dr. RAO recommends nationwide vaccination with B.C.G. While the progress of this course has been satisfactory in other parts of India, people in the South have not taken kindly to it, due probably to the strong opposition voiced by an influential group of persons. When in course of time the evils and complications supposed to result from B.C.G. are proved to be unfounded, public response would be greater than it is at present. Dr. RAO estimates that one team of vaccinators can vaccinate about 100,000 persons a year and at this rate at least 200 teams would be required to cover the whole country. The expenditure would come to about 30 lakhs a year at the rate of Rs. 15,000 for a team in a year. It should not be difficult for the Governments in this country to provide this money. But the plan will fail in its purpose unless, side by side with it, steps are also taken to improve envorenmental conditions and nutrition. If with B.C.G. vaccination, the standard of living and public health are improved, the President believes that in the course of 15 or 20 years mortality from tuberculosis can be reduced to 4/5 the present rate. But it is a big "if", and it is for the

Governments to take effective steps to bring about that laudable consummation.

On the curative side, while the advent of Streptomycin and other antibiotics has brought about a revolution in the treatment of tuberculosis, the President has turned to the other side of the shield and pointed out its drawbacks and the complications it creates when used injudiciously. He says: "In certain types, the organism appears to have a tendency to grow more luxuriantly in the presence of Streptomycin and so the patient gets worse. In certain other forms, the tubercle bacilli become resistant to Streptomycin and so Streptomycin has absolutely no effect on that particular individual. This second complication is a very great danger from the public health point of view because the contacts who are infected with the disease by Streptomycin-resistant patients also become Streptomycin-resistant. Thus the number of resistant cases would increase and would become a positive danger to society and nullify the good effects of this drug". It therefore becomes necessary for the Governments and organisations engaged in tuberculosis relief work to see that those who are entrusted with the treatment of cases are well equipped with the knowledge needed to treat them.

When accommodation for institutional treatment is very meagre and some sort of home treatment has to be given to a large number of patients, it becomes necessary to equip the general practitioners also with the required knowledge. For this purpose the President suggests that Refresher Courses in tuberculosis must be held in different parts of the country more frequently than it is done at present. This would not involve any extra expenditure and it should not therefore be difficult to arrange for it at regular intervals.

Finally, the President suggests that a comprehensive scheme should be drawn up for each State, laying down definitely the lines on which it should be worked out on a three-year period, the ultimate goal being aimed at in the course of five to ten such periods. We commend this suggestion to the earnest consideration of the Governments, Central and States, for immediate attention.

Radium Treatment of Cancer of the Rectum

In post-operative superficial recurrences of rectal cancer complete regression with healing was obtained by employing a uniformly distributed, appropriate dose of radium at least equal to that used in cancer of the skin. Only mucus secreting tumours were found to be resistant to radium. The tolerance exhibited by the rectal mucosa had a definite relation to the type of the filter used; *e.g.*, it was greater when a 2 m. m. platinum filter was used than when 1 m. m. thickness was employed.

In 11 cases early carcinoma situated low in the rectum 1 to 2 inches in diameter was treated. In six of them satisfactory results were obtained which have lasted for 3 to 7 years. The five which did not respond were mucus-secreting adenocarcinomata: The author concludes that the use of 2 m.m. platinum filters presents possibilities in the treatment of inoperable cases.—*Polsk. Tyg. Lek., Eng. Abst.*, 4, 513-515, Jan. 1950.

SURGERY

The prevention of secondary hæmorrhage following tonsillectomy.—Secondary hæmorrhage following tonsillectomy is a very real problem—much more so than realized by the average operator. After careful surgery has been performed, Jones [*Southern Medical Journal*, 42: 124, February, 1949] prescribes the following regimen for his tonsillectomy cases:

1. Aspirin should *not* be prescribed in amounts sufficiently great to cause hypoprothrombinæmia; furthermore, it "should not be prescribed, in any form, for local administration following tonsillectomy". (The author specifically prohibits the use of chewing gum containing aspirin).

2. A combination of 5 mg. Synkayvite and 100 mg. ascorbic acid is given 3 times daily to all patients, occasionally for several days before operation and always post-operatively.

3. Sulphanilamide or sulfathiazole powder is sprayed into the tonsillar fossæ twice daily after operation to prevent infection. Sulfathiazole nose drops are used following adenoidectomy.

Jones treated 75 cases this way with not a single case of secondary hæmorrhage. In conclusion he advocates the routine use of Synkayvite and ascorbic acid for all patients undergoing tonsillectomy.—*Medical Times.*

Experiences with cardiac arrest.—F. H. Lahey and F. R. Ruzicka (*Surgery, Gynæcology and Obstetrics*, 90:108, Jan. 1950) report that 13 cases of cardiac arrest occurred in the operating room at the Lahey Clinic in seven years. Of these 13 patients, 5 recovered, and in the other 8 the cardiac arrest was overcome, but 7 patients died later due to cerebral damage, and one of acute cardiac failure. On the basis of the results in these cases, the authors conclude that in cases of true cardiac arrest, cardiac action must be restored within three and a half minutes if the patient is to recover without cerebral damage. In order to treat cardiac arrest successfully the anesthetist and the surgeon must be on the alert. In most cases the anesthetist will be the first to be aware of cardiac arrest and must notify the surgeon. Cardiac arrest may occur in any type of operation and with any type of anesthesia. In the cases reported, cardiac arrest occurred during a chest operation in 3 cases; an abdominal operation in 4 cases; thyroid operation in 2 cases; sympathectomy, brain operation laryngoscopy in one case each; and during induction of anesthesia in 1 case. A planned programme of treatment of cardiac arrest is necessary, and the required instruments and drugs should be immediately available. The plan of treatment advocated by the authors consists of: Artificial respiration with 100 per cent oxygen; immediate cardiac massage; drug therapy with procaine and epinephrine; general methods, including intravenous administration of fluid and the Trendelenburg position. The cardiac massage is "the all important step," and should be instituted at once by the surgeon; however, if procaine and epinephrine are immediately available, a cardiac puncture is done for aspiration of blood and injection of the solution; this procedure is not indicated unless the syringes and solutions are ready for immediate use. For artificial respiration with oxygen an unobstructed airway is necessary, and an endotracheal tube must be inserted by the anesthetist, while other procedures are being carried out, if such a tube is not already in use. Artificial respiration may be needed in some cases for hours after cardiac activity is restored; and in other cases for only a few minutes. The epinephrine-procaine solution for intravenous injection contains 0·5 cc. of epinephrine 1:1000 and 9·5 cc. of procaine, 1 per cent; so that both drugs may be given simultaneously, preferably into the antecubital vein; or it may be injected into the heart as noted

above. If cardiac activity is slow in returning, epinephrine may be omitted for a time until some degree of automatic cardiac activity returns; but procaine should either be repeated or be given by continuous intravenous drip until the cardiac action is regular.—*Medical Times*, Aug. 1950.

Amniotic grafts in chronic skin ulceration (Preliminary report of the successful results).—(*Lancet*, 6-5 50, pp. 859-60).

Dr. E. Troensegaard-Hansen, F.R.C.S. of the Charing Cross Hospital, London, obtained good results between 1939 and 1942, in 7 bedridden patients aged 60 to 80 years who had ulcers for 4 to 15 years, and were in hospital for 3 years, by applying amnion grafts. He applied these to six and had the seventh dressed with soft paraffin gauze only as a control. In 10 weeks the six ulcers treated with the amnion healed up completely and the control had not. This was subsequently treated with amnion and healed up in 5 weeks. He, therefore, firmly believed that amniotic membrane possessed some specific healing power. Chao *et al* (*Bri. Med. Jour.*, 1940: 1, 517.) used amnion to close dural defects. In 1949, he started a new series of cases in Charing Cross Hospital, and so far there had been a single failure.

Technique:—The "caul" (fœtal membrane) is obtained from the obstetric wards within 24 hours of a delivery. It is cleaned and the amnion is carefully freed from chorion and clots. To be suitable for use the amnion must be thin, clear, tensile and strong with no yellow tinge from meconium staining. The amnion, thus collected and cleaned, is boiled for 7 minutes in normal saline (0·85 per cent) and preferably used immediately. It can, however, be safely kept dry in a sterile pot for 24 hours, but if not used within this time should be discarded. An average confinement provides a piece of amnion about 8 inches square which on boiling contracts to 4 inches square.

The patient, on admission, has his ulcer scraped with a Valkmann's spoon under general anæsthesia. A dressing of phenoxetol cream is applied covered with gauze and left *in situ* for 5 days after which the dressing is removed, the ulcer gently cleaned and the prepared sheet of amnion is carefully spread over it. Hansen has found it best to apply the smooth side which secretes the amniotic fluid *in utero*, to the ulcer. The area is next covered with soft paraffin gauze and wool held in place by pressure bandage. Patient is sent home to rest in bed and dressing is removed after 6 to 10 weeks according to the size of the ulcer. No other treatment is given.

Pulmonary resection in pulmonary tuberculosis.—(*Dis. of Chest.*, 17, April 1950, pp. 464–479).

In an elaborate and well-illustrated article, Drs. Perez, Caeiro, Langer, and Wolaj of Cordoba in Argentina (S. America) review the entire available literature on this subject, and report on the results of their experience of pulmonary resection in three complicated cases of pulmonary tuberculosis. The subject of the above article formed the basis of a demonstration at a meeting of chest physicians from different parts of America and an interesting discussion followed. Some of the facts brought out during this discussion are very illuminating: Below is given the outstanding experience of *Dr. J. D. Murphy of North Carolina*:—Pulmonary resection is reported to have been done in 616 cases up to May 1948, with an overall mortality of 26%, and an immediate operative mortality of 15%. His own experience prior to the advent of Streptomycin was limited to eleven resections, for residual post-thoracoplasty cavities. The results were discouraging. Since January 1947, he had done 74 resections *using Streptomycin as a prophylactic* agent in spreads, empyemata and fistulæ. Indications for which the operations were performed are:—(1) Residual cavity after thoracoplasty 38 cases, 13 of whom had endobronchial disease. (2) Failure of collapse therapy 13 cases, endobronchial disease was present in 5 of these and hilar or basal cavity in 5. (3) Tuberculer bronchiectasis 13 cases and destroyed

lung 10 cases. (As an elective procedure 7 cases, severe endobronchial disease 3 cases, tuberculoma one case).

In view of the established safety of pulmonary resection, using modern surgical technique, with Streptomycin and adequate blood replacement, there can be little quarrel with any of the above indications, except that of elective procedure. The low mortality and favourable early results in his series is shown *by comparing the operations done in the pre-streptomycin era with those following the use of Streptomycin.* Early deaths have been reduced from 18% to 8·1%; late deaths from 18% to zero; empyemata from 55% to 5%; fistulæ from 55 % to five per cent; spreads have been reduced from 27% to four per cent; sputum conversion has been increased from 55% to 92% of the living patients.

OBSTETRICS AND GYNÆCOLOGY

The present status of penicillin in the treatment of syphilis in pregnancy and infantile congenital syphilis.—(*Am. Jour. Med. Sciences*, Apr. 1950).

Crystallizing the information on penicillin therapy in the prevention and treatment of congenital syphilis, Ingraham and Beerman of Philadelphia have furnished a statement to the Expert Committee on Venereal Infections of the W.H.O. This brings up-to-date all published material, and clarifies the clinical observations originally made. The authors present a fully explanatory statement of principles with respect to the use of penicillin in the prevention of congenital syphilis :—

A. *Pregnancy and syphilis*:—The following facts are fairly well established in the treatment of the syphilitic pregnant woman with penicillin.

(1) Penicillin readily permeates the human placenta. This occurs in the later months of pregnancy and indeed as early as the tenth week of gestation.

(2) Very small amounts of penicillin, even total dosage in the magnitude of 300,000 to 600,000 Oxford units, given to women with active recently acquired syphilis in the latter months of pregnancy, are often adequate to prevent infection of the fœtus in utero and to result in the birth of a healthy infant. Even though a mother is not cured of her syphilis, she may yet give birth to a normal healthy baby through penicillin treatment during pregnancy.

(3) Pregnant women treated with larger amounts of penicillin will give birth to almost 100 per cent non-syphilitic infants regardless of the stage of syphilis treated. The infrequent failures following penicillin treatment may be due to 2 causes: (*a*) the fœtus may have been diseased beyond recovery before starting treatment; (*b*) a single course of penicillin treatment given to the mother with active infectious syphilis usually early in pregnancy may be insufficient to result in the cure of the mother.

(4) Penicillin need not be supplemented by arsenic or bismuth as the penicillin alone will protect the fœtus satisfactorily. These results are not likely to be improved by arsenic or the heavy metals. The toxicity of arsenic makes its use contra-indicated in this circumstance when penicillin is more effective.

(5) Treatment reactions to penicillin have not proved to be serious or to need any modification of the course. The fear that penicillin may induce uterine contractions, placental separation or premature labour has proved groundless, except in the case of grossly diseased fœtus.

Points still open to some controversy or doubt in the penicillin treatment of pregnant women:

(1) *The optimum treatment course*:—Since larger amounts of penicillin (a total of 2·4 million Oxford units administered every 2 to 3 hours at the rate of 40 to 50,000 units) will *not* apparently harm the fœtus, it seems best to gauge the dose for the mother on the requirements of the maternal syphilis rather than base it on the optimum dosage to

protect the fœtus. The optimum duration of treatment with penicillin for the syphilitic pregnant woman has not been finally determined. Till now 7 to 12 days' treatment has been used with success. Shorter courses have not been appraised. Syphilitic babies born of mothers with active syphilis who have been treated with penicillin during pregnancy averaged 1·8% to 2·0%.

(2) *The addition of absorption delaying vehicles to penicillin for ambulatory treatment* is still a matter awaiting final decision. Provided the preparation used can be relied upon to give sustained blood and tissue levels of penicillin in both mother and fœtus, there is no reason to feel penicillin in absorption delaying vehicles is not satisfactory for the treatment of the syphilitic pregnant woman.

(3) *Re-treatment of women in subsequent pregnancies*:—If a woman is "*cured*" of her syphilis by penicillin treatment as revealed by necessary tests, she may safely go through subsequent pregnancies untreated without risk of infection of the fœtus. The crux of the problem, however, is the criteria of '*cure*.' Because of the difficulty of correctly assessing complete cure in every case, it is not certain that withholding treatment in subsequent pregnancies can, as yet, be recommended as a standard routine procedure.

B. *Infantile syphilis*:—The time to treat infantile syphilis is *prenatally*. The offspring of syphilitic parentage should be uniformly studied for syphilis regardless of clinical appearance of good health, by blood tests, by X-rays of the long bones, and other tests. Therapeutic shock will occur in 50% of infants with congenital syphilis and may be severe (high temperatures 104°F–105°F., circulatory collapse etc.) It is desirable not to modify the penicillin dosage. The superiority of penicillin over other types of therapy in the infant is that it will treat intercurrent pyogenic infections as well as syphilis.

The number of motile spermatozoa as an index of fertility in man.—(*Jour. Urology*, 61, 1099-1104: *Amer. Pract.*, March 1950).

Dr. Edmond J. Farris analysed 406 semen specimens supplied by 239 men. 70 specimens were supplied by 49 men who were fathers. Every one of these 49 possessed at least 83 million or more active sperm in his total ejaculate. Men whose wives conceived readily had higher active sperm counts than those whose wives conceived with difficulty. 23 men supplied 46 specimens for analysis. Each man supplied 2 specimens on succeeding days. Men with counts of 185 millions or more active sperm on the first day had fertile counts of 83 millions or more moving sperm on the next day. Men with counts of less than 185 millions on the first day had subfertile counts of less than 83 millions on the second day. Men whose sperm counts averaged more than 83 million moving cells in the total ejaculate had proved themselves fertile. Men with characteristically better semen pictures had *more* children. The male with more than 185 million active sperm remained in the fertile zone at the second emission on the following day and possessed at least 83 millions moving active sperm.

3 groups were classified according to fertility:-Males with more than 185 *million* active sperm in the total ejaculate were classified as *highly fertile*. Those with a range of 83 *to* 185 *millions* as *relatively* fertile. Men exhibiting *less than* 83 *millions* active sperm in the total ejaculate as *subfertile*. Sperm counts of certain individuals vary from time to time and this fact would account for an occasional conception that may occur among those men classed as subfertile.

[The author considers this classification as the *best means for evaluating the fertility of the individual* short of his ability to produce offspring. *No man* with a total active sperm count of *less than* 83 *millions had been able to have children.*]

Value of vaginal smear.—(*Amer. J. Obst. Gynæcol.*, 58, 843–850, 1950).

Drs. Graham and Meigs carried out the examination of the vaginal smears during a period of six years from 1943–1948, as an aid in the diagnosis of uterine cancer. A total of 8130 slides

was examined and 432 cases of carcinoma of uterus were detected. The false positives in this large series were negligible being only 0·04 per cent. A positive smear thus meant the presence of cancer. False negative smears were about 10 per cent. This figure was due to the absence or paucity of cells in advanced cases and a lack of exfoliation in others. Smear and biopsy diagnosis are really complementary and not independent rival methods.

RADIOLOGY

Differential diagnosis between benign and malignant ulceration of the stomach.—(*Br. Jour. Radiol.*, 22, 280–283, 1949).

Dr. Elekeles examined lateral radiographs of the abdomen of 184 patients over the age of 50 for the presence of calcification of the aorta. This was with a view to correlating the incidence of gastric ulcer and gastric carcinoma with the presence of general arteriosclerosis. 32 of the 184 patients suffered from gastric carcinoma, 36 from gastric ulcer and 55 from duodenal ulcer. In 61 cases there was no evidence of disease in the gastrointestinal tract.

The percentage of cases in each group in which evidence of aortic calcification was found was :—gastric ulcer 69·4 ; duodenal ulcer 14·5 ; gastric carcinoma (only one case) 3·1 and the controls 22·9. The relatively high value for the gastric ulcer group is significant. The available literature also supports the theory that vascular occlusion resulting from arteriosclerosis is frequently the cause of gastric ulcer in middle-age and old-age. *The strikingly low incidence of calcification of the aorta in cases of gastric carcinoma would appear to lend support to the view that this might be used as an index (or at all events an additional confirmatory evidence) in the differential diagnosis between benign and malignant ulcer of the stomach.*

Irradiation of the pituitary gland in treating hypertensive vascular disease.—*Am. Jour. Sciences*, 219, 3, March 1950, pp. 276–281).

Best *et al* of the Institute for Medical Research, Louisville, Ky. studied 43 hypertensive patients (aged 27 to 65). 25 were treated by irradiating with 2000α units (measured in air) the region of the pituitary gland, as recommended by Burn and others, without significantly lowering of blood pressure. 17 (68%) had symptomatic improvement. 3 (12%) showed a fall in blood pressure of 30 mm. Hg. systolic or 20 mm. Hg. diastolic, but no other objective evidence of improvement was noted. The 18 control patients were managed in an identical manner with the treated group except for the roentgen therapy (which was not actually given). 14 (78%) improved symptomatically. 3 showed a fall in B.P. of the same order as the treated series (above). The only complication noted as a result of the roentgen treatment (3 to 5 months duration) was a loss of hair in the temporal region of some patients.

MEDICINE AND THERAPEUTICS

Streptomycin resistance of tubercle bacilli.—(*Br. Med. Jour.*, 27-5-'50.)

In a leading article the *British Medical Journal* reviews the recent report to the "Streptomycin in Tuberculosis Committee" of the Medical Research Council by a band of distinguished research workers (from the Brompton Hospital and the Post-graduate Medical School of London). This team of eminent chest surgeons and specialists carried out an investigation to attempt to alter the development of streptomycin resistance by the use of four different schemes of dosage. In the first, a group of 9 patients was treated with 0·5 g of streptomycin six-hourly for alternate weeks ; in the second, 13 patients were given 0·5 g six hourly for alternate months ; the third group of 12 cases had 0·25 g of streptomycin six hourly without intermission ; and the fourth group of 11

patients had 1·g (one gramme) in one single dose daily without intermission. The cases were all of acute progressive bilateral pulmonary tuberculosis, of recent origin, unsuitable for collapse therapy, the patients being between 15 and 30 years of age. Treatment was continued for six months and the time, in the course when streptomycin resistant organisms were isolated from the sputum was noted for each case, and the results in the different groups compared. The emergence of streptomycin resitant bacilli in all the four groups occurred at the same time and in the same proportion of cases in each group. The degree of resistance was also of the same order in each group. So the attempt to delay the emergence of streptomycin resistance was a failure. The groups were also reviewed from the point of view of radiographic and clinical change during the period of treatment. No significant difference was seen between them. The single injection of 1 gramme daily was as satisfactory as the more elaborate methods. Since this trial ended it has become clear that the most promising work or the possibility of delaying the emergence of streptomycin resistance is concerned with the use of other drugs with streptomycin.

The report of Karlson *et al* (*Amer. Rev. Tuberc.*, 59 : 438.) and the preliminary statement by the British Medical Research Council (*Lancet*, 2, 1237 : 1949) suggest the use of *P.A.S. concurrently with streptomycin*, to reduce the incidence of streptomycin resistant tubercle bacilli. The idea of combined drug therapy is not new and has been used in other infective processes. It has not been developed in tuberculosis. Yegian and Vanderlinde (*Amer. Rev. Tuberc.*, 1950, 61 ; 483) have reported favourably on combined drug therapy, such as the use of drugs *from the very beginning* of drug treatment or the use of one drug for a period and then the addition of the other. "If the second drug is withheld too long the bacterial population may increase and consist chiefly of cells resistant to the drug given initially and resistance to the second drug may occur as rapidly as if it had been used alone ; thus the effectiveness of combined therapy in reducing the incidence of resistant strains will be lost."

Carstensen and Linde Andersen (*Lancet*. 1950, 1 ; 878) *use P.A.S. as a routine* in the treatment of tuberculosis and *supplement it by short courses of streptomycin* when serious complications occur or before surgical procedures. They have found that the combination of the two drugs in this way does *not* prevent the emergence of resistance to streptomycin. So far there have been no reports of the development of strains resistant to both drugs given in combination to patients who have never previously had either.

Oral and pharyngeal complication of chloromycetin therapy.— (Williams, B., *Amer. Practitioner*, Sep. 1950, pp. 897–900).

Williams directs attention in this paper once again to the oral and pharyngeal complications that arise during the treatment of infections, by the administration of chloromycetin. Of 200 patients receiving the drug, he observed 12 (or 6 per cent) who developed glossitis and black tongue, stomatitis, pharyngitis, and infection of the mouth and throat by the yeast like fingers, *Monilia albicans*, while they were on chloromycetin therapy. In 6 of them, the symptoms were so severe that treatment with the drug had to be discontinued. Apart from the symptoms and signs of inflammation, there was a change in the bacterial flora of the mouth and throat so that monilia albicans could be easily isolated and signs of moniliasis were seen in five of them. The pathogenicity of Monilia albicans for man is usually limited to nursing infants (particularly the malnourished or unclean infants) and to adults in the terminal stages of wasting diseases.

Sommer and Favour (*Amer. J. Med.* 7, 511, 1949) reported 4 patients who were being treated with penicillin in whom the bacterial flora changed from gram positive to a predominating gram negative type. These were either old people or those weakened by disease.

Chloramphenicol has been proved to be effective against a large number of bacteria of both the gram positive and gram negative group. In some this

antibiotic apparently therefore suppresses both groups to an extent that allows overgrowth and invasion by the yeast-like fungus. The possibility that this same type of invasion may occur in the lungs or elsewhere in the body with more serious complications should be kept in mind. It is possible that some of the reactions observed in patients receiving chloromycetin may be due to the local effects of the drug. Salivary excretion is evidenced by a bitter taste noted by many patients receiving 2 gm. a day. The 12 cases who developed the toxic symptoms noted above, were patients who were treated for acute pyelonephritis, regional enteritis, bronchiectasis, urinary tract infections, subacute bacterial endocarditis, severe ulcerative colitis, pneumonia and amœbic dysentery.

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Terramycin.—(*Lancet*, 10-6-1950, p. 1080, Annotation). Is a crystalline compound which forms salts with both acids and bases; these are stable at room temperature and may be kept without loss of potency for at least a year. This new antibiotic is effective against gram positive and gram negative organisms and some rickettsiæ and viruses. In many respects terramycin is comparable in its range of activity to aureomycin, and like aureomycin and chloromycetin is effective by mouth. In doses of 500 to 750 mg. six hourly (*i.e.* 2–3*g* daily) it can be detected in active concentrations in the blood C. S. F., pleural cavity, bile, urine and fæces. It also passes the placental barrier and so can be given in pregnancy for the treatment of mother and fœtus. Terramycin is relatively non-toxic, and according to Herrell *et al* of the Mayo Clinic the diarrhœa, nausea, and vomiting that sometimes occur when taken in an empty stomach can be overcome by giving it in a capsule with milk. Glossitis is sometimes noticed, and is a side effect which has been described with other antibiotics taken by mouth. With ordinary dosage terramycin excreted in the fæces may produce concentrations as high as 2·5 mg. per c.c. Considerably higher concentrations are attained in the urine with terramycin than with aureomycin.

Organisms sensitive to terramycin are pneumococci, *Staph. aureus*, *Streptococci* hæmolytic and nonhæmolytic, pertussis, *Influenzae*, *Ba. abortus*, *Suis*, *melitensis*, Freedlander's bacillus, *B. coli*, *pyocyaneus*, *P. tularensis*, spirochaetes, Q fever, rickettsial pox and the viruses of primary atypical pneumonia, lymphogranuloma venereum, and influenza. The preliminary clinical trials of Herrell *et al*, King *et al* and Hendricks *et al* in the U. S. A., show that conditions responding satisfactorily to terramycin include pneumococcal pneumonia, urinary tract infections due to *B. coli*, Ba. pyocyaneus and streptococci; bacteræmia due to susceptible organisms; lung abscesses; follicular tonsillitis; and erythema multiforme. In syphilis, gonorrhœa and granuloma inguinale also, it has given very good results.

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Effect of rigid sodium restriction in cases of ascites and cirrhosis of liver.—(*Jour. Lab. Clin. Med.*, 34, 1029-1038).

Eisenmenger and his collaborators studied 13 patients admitted into the Rockefeller Institute Hospital, New York, with cirrhosis of the liver. Ascites was present for 4 to 48 months prior to the onset of low salt therapy and had necessitated 2 to 78 paracenteses. None of the patients were suffering from an enlarged acutely decompensated fatty liver at the time of admission. The diets used were prepared by trained dietitians who kept careful records of the daily intake of protein, fat, carbohydrate and salt.

All the 13 patients studied showed complete cessation of ascites formation when the sodium chloride was limited to 1 gramme per day. Higher intakes caused ascites formation in direct proportion to the NaCl given. An average critical level of NaCl intake was obtained for these patients above which ascites formation occurred. This was 1·2 gm. per day. The reason for this direct relation between NaCl intake and ascites was that the NaCl excretion in the urine was extremely low regardless of how much NaCl was given in the diet; with this low excretion of NaCl it is apparent that the large part of the NaCl intake is utilised to form ascitic fluid.

All but one of the 13 patients were able to tolerate the low sodium regimen for at least 3 months without ill effects. All of them showed a rise in serum proteins on the low sodium diet. *The general clinical results of a 3 months period* on the low NaCl diet were evaluated by studying the effect of normal sodium intake on ascites at the end of three months. Four patients recovered completely, in that they were able to excrete the increased sodium intake and they did not re-form ascites. These patients gradually absorbed the remaining ascitic fluid and returned to a normal life. Eight were still unable to excrete larger amounts of Na and accumulated ascites on the normal diet. These had not regressed during the 3 months of sodium restriction and all of them appeared slightly improved but they had not been cured. No restriction was reinstituted in these 8 cases; three of them have since showed increased sodium excretion representing loss of ascitic fluid after more than 6 months of therapy; others are being still treated with combined liver extract and low sodium therapy.

In all the patients the diet appeared to be beneficial in stopping the malignant course of events brought about by removal of protein through paracenteses in the already depleted patient, thus enabling dietary therapy to become effective. The long term clinical results are difficult to evaluate but the fact that ascites formation could be completely controlled by rigid sodium restriction was clearly evident.

BOOK REVIEWS

The Practice of Medicine—By JONATHAN CAMPBELL MEAKINS, C.B.E., M.D., L.L.D., D.SC., Formerly Professor of Medicine and Director of the Department of Medicine, McGill University; Formerly Physician-in-chief, Royal Victoria Hospital, Montreal; Fellow of the Royal Societies of Canada and Edinburgh; Fellow of the Royal Colleges of Physicians, London and Edinburgh &c., &c., &c., 1950, 5th Edition, 1558 pages with 518 illustrations including 50 in colour. [The C. V. Mosby Company, St. Louis.]

This fine text book is intended mainly for the student of medicine and the general practitioner to enable them to solve the many complicated problems which confront them in their daily work. As the author mentions in his introductory chapter, "the practice of medicine deals with human beings and requires a complete understanding of all aspects of human life." The whole book has been written with this aim in view. Beginning with a chapter giving hints as to the proper approach to all patients and to evaluate symptoms in the proper manner, the author proceeds to follow the usual orthodox manner. The diseases of the various systems are described in a detailed manner. There are chapters on diseases of nutrition and metabolism. The subjects of allergy and chemotherapy and antibiotics are thoroughly discussed. Diseases due to chemicals and drugs have a separate chapter. The chapter on psychosomatic medicine requires special mention. All these and other chapters are well written and show the scholarship and broadmindedness of the author. The illustrations are very good and are informative. The general get up and printing are also excellent. We congratulate the author on his great work and recommend it to all concerned. —U.K.B.

Adolescence Problems—By WILLIAMS S. SADLER, M.D., F.A.P.A., Chicago. [The C. V. Mosby Company, St. Louis.]

Adolescence is the period of transition between childhood and adulthood. To many youths and to many parents this transition is a very trying experience. Love and proper guidance will solve many of the troubles. This book is written for physicians, parents and teachers and is designed to make available for them the counsel and guidance necessary to help youth to tide over this difficult period. The discussion has been undertaken in six sections—Psychological and emotional life, home and family life, education and schools, social and economic adjustments, sex problems and moral adjustments and abnormalities of adolescence. Such important questions as 'What is Adolescence? What is the value of recreation in adolescence? What is the influence of home and family life on youth? What hints would you give to parents in the management of youth? What are the educational and social problems of adolescence? What are the duties of the adolescent to his country and in what manner can his services be utilised? What are his sex problems? How can we prevent youth from becoming a delinquent? are discussed in detail and many constructive suggestions are given in the answers to these interesting questions. The author has brought to bear on all these problems his experience of over forty years of work and has incorporated in these discussions modern opinion of both educators and psychiatrists. It is a difficult subject well written. —U.K.B.

History and Trends of Professional Nursing—By DEBORAH MAC LURG JENSEN, B.N., B.S., M.A., 1950, Second Edition, pp. 365, Illustrated. [The C. V. Mosby Company, St. Louis].

This book gives a vivid description and the trends which have influenced the development of nursing as a profession, since its very origin from the earliest of times in Europe and America and its influence on the various Eastern countries. The book is divided into XIX units; and begins with pre Florence Nightingale Nursing as a background for the development of Professional Nursing. Development of Nursing has been traced under three periods: (1) From the earliest of times until the latter part of the 18th century. (2) From the latter part of 18th century until the establishment of the first Modern School for Nurses at St. Thomas Hospital, England, in 1860. (3) From 1860 until the present.

Writing of ancient hospitals, mention is made of Lord Buddha's instruction to villages to construct and maintain a separate building for the care of the sick. "They were complete with kitchen and operating rooms, and strict and simple regulations were established for the equipment of the hospital. The old Hindu Surgeon was highly respected and capable of considerable surgical technique, though somewhat conditioned by religious ritual. Much was done to look after the patient's spiritual welfare, and kindness was a prominent feature of the institution. It was maintained by a regular tax. Similar institutions were established for the care of the sick animals. . . . ." In another place is found: "When we study the state of nursing in a country like India we are impressed with the importance of these factors .. .. We see here a country with an age old culture of the highest order, where poetry and other literature rank high, where riches have been amassed almost beyond comprehension, and where religious and ethical philosophy are highly developed, as well as the social structure. Though these may seem strange to the Western minds, they are certainly not primitive or underdeveloped as they are in the Australian or African wilderness." In 1885 under the Lady Dufferin Fund, helped by all the royalty and nobility of India, nursing aid to the various institutions were started under the inspiration of Queen Victoria and Florence Nightangle—thus began the modern nursing in India. But it will be very interesting to note, that the Madras hospital began training in nursing as early as 1854. Nursing in India has thus grown to what it is today, striving to bring home modern health conditions to its teeming millions spread through its remotest villages.

It is a very interesting book which would be found useful by all interested in nursing and to the nurse an inspiration.

Scientific Principles of Nursing—By M. ESTHER MC CLAIN, B.N., B.S., M.S., 1950, pp. 410, Illustrated. [The C. V. Mosby Company, St. Louis].

This book describes in detail how basic science and scientific principles help in training nurses and how nursing procedures may be carried out intelligently in their practice.

The author stresses the need for mental and physical health, alertness, technical competence, dependability, ability to inspire confidence, resourcefulness, poise, consideration for others, co-operation, agreeableness, culture, satisfaction from work, and professional responsibility, to be included in the curriculum guide for Schools of Nursing. These characteristic features must be acquired by every one who wishes to be a nurse. Only then can she exert a good influence in her patients, inspire in them a desire to live, and be an example of mental and physical health.

The book is divided into five units: Orientation to hospital nursing, the patient in the hospital, the patient's needs, making the diagnosis, and the therapeutic measures. A well-thought out book which would help all those engaged in the training of nurses in their effects and for the pupil nurses, a very useful guide in their management of the sick.

We recommend it to all our readers and institutions interested in the teaching of nurses. The illustrations, printing and the get-up are of a high order.

Eyes and Industry—By HEDWIG S. KUHN, M.D., 1950, 2nd Edition with 151 text illustrations and 3 colour plates. [The C. V. Mosby Company, St. Louis].

With the growth of industry, the relation of visual acuity to the economy of the industry has been greatly appreciated, and many problems regarding Vision and Industry have of necessity produced what is called Industrial Ophthalmology.

Industrial Ophthalmology demands a thorough understanding of the principles of industry, with reference to efficient vision in all phases of production, and hence it is essential that practitioners doing medical inspection of workers in factories and industries with reference to Eye Sight, must have a thorough knowledge of detecting defective vision, correcting these defects, and providing other Ophthalmic Services, illuminative factors, protective services etc., sorting workers for particular work in accordance with visual acuity, so that man power may be conserved, and even the blind and the semi-blind can find a place among the workers of a factory.

This book gives all about the need and care of good eyes, and medical men engaged in industry will find much that is needed to produce, to avoid waste, through errors and inaccuracies. One must see, have eyes, and use them effectively, and to have two eyes or even one eye, one must guard them by physical protective devices. This book tells you all about them. There is a very useful appendix. We recommend it to all industrial workers, particularly to the medical men

engaged in medical inspection of factories. Here is a much needed book. The illustrations are very instructive.

Mastering Your Nerves—By A. T. W. SIMEONS, M.D., First Indian Edition; Published by D. B. Taraporevala Sons & Co., Ltd., 210, Hornby Road, Fort, Bombay-1. Price Rs. 4/-

Messrs Taraporevala Sons & Co., Ltd., deserve to be complimented on bringing out a cheap Indian edition of this highly instructive and useful foreign publication. It is a mine of information which should be studied by every one anxious to preserve his or her health. The intention of the book, as stated by the author, is to prepare the patient and put him on the right track. The people have been brought up to believe in *mind over body*. So one gets terribly alarmed when the body shows signs of usurping power over the mind. But the truth is that when the mind and body quarrel, it is always the body that comes out on the top. The human mind is generally foolish; the body never. The trouble with the mind is that it does not appreciate the basic fact that all the internal activity in the body is governed by a nervous system which is very largely independent of the higher centres of the brain and is therefore called the *autonomous nervous system*. The mind therefore continues to hurl unjustified abuse and slanderous invectives at its humble servant as a result of absolute ignorance as to how the body and its nerves work. Once we understand their ways our nerves cannot get the better of us so easily as is the case with many at present. Written in very simple and easily understandable language, its great merit lies in its highly practical and feasible suggestions. Divided into 16 chapters, it deals practically with every supposed ailment and gives out useful suggestions to get over it. It would be a great boon to the public who are unfamiliar with the English language if the book is translated at least in the most important regional languages and the knowledge made available to them. The get-up leaves nothing to be desired.

From the Hills—By JOHN ZAHORSKY, M.D., Published by The C. V. Mosby Company, St. Louis, U.S.A.

The title of the book might lead one to think that it is either a story from the hills, or one describing something notable and important in the hills. It is neither the one nor the other. It is a very interesting, educative and highly instructive autobiography of a pediatrician who worked his way up from very small beginnings and secured a leading position among the pediatricians and who still continued to carry on in the third or declining period of his life. The love for the family name is so great in him that he has chosen its English equivalent as the title of this book. While the author thinks that this book may be interesting to his grandchildren if they ever have enough leisure to read it, or to some of his former little patients, grown up now, we are sure that the history of the trials and tribulations he had to pass through early in his course and the perseverance and industry with which he overcame them all, are object lessons for budding practitioners aspiring to rise high in the profession. The time when he started practice was not propitious; the financial depression which had begun a few years earlier persisted; the political atmosphere was saturated with accusations and recriminations between the rival parties: money was scarce; the price of necessities had advanced sharply; the factories and shops had requested their employers to march for gold; and sick people everywhere crowded into the free clinics for medical advice and the family doctor was dismissed Yet, undaunted, he carried on in hope, and that did not fail him. The secret of his success lay in the correct code of conduct he laid down for himself. We shall quote his own words: "It is an old economic law that no one can acquire great wealth without making some one poorer. This law also applies to the medical profession. An epidemic invariably makes the doctor prosperous and his clientele poorer. An era of prosperity acts the same way, for the parents desire protection for their offspring. They consult physicians for trivial disorders and go to the highest priced specialists who are assumed to be better than the family doctor. When a financial avalanche descends, the pediatricians must repay his friends by lowering his fees and increasing his charitable contribution. His net income skids down and he finds himself in the valley where he started. Despite the precipitous descent, I never became morbidly depressed. Had not the children's doctors with the help of scientific research conquered the contagious diseases? Had not the death rate of infants and children fallen more than fifty per cent? Can dollars yield as much satisfaction as a conviction that a powerful barrier against disease has been constructed? I thenceforth resisted the temptation to acquire great wealth." We are sure that every one of the members of the profession and the public would be greatly profited by reading this book which has been written in a very simple and good style. The printing and get up are of the usual Mosby standard.

The Mask of Sanity—By Hervey Cleckley, M.D., Professor of Psychiatry and Neurology, University of Georgia School of Medicine. Angusta, Georgia; Second, revised and re-written edition. 569 pages. Published by The C. V. Mosby Company, St. Louis, U. S. A.

The first edition of this book which was published ten years ago was based primarily on experience with adult male psychopaths hospitalised in a closed institution. During the last decade a much more diverse group has been available. Female patients, adolescents, people who have never been admitted to a psychiatric hospital, all these in large

numbers have afforded an opportunity to the author to observe the disorder in a very wide range of variety and degree. This additional clinical experience, helpful comments in the reviews of the first edition, enlightening discussion with colleagues, an improved acquaintance with the literature, all have contributed to help the author to modify concepts formulated ten years ago. He had therefore practically to write a new book. The chief aim of this study is to bring before psychiatrists a few of these cases typical of hundreds more who have proved so interesting to the writer, so difficult to interpret by the customary standards of psychiatry, and, all but impossible to deal with or to treat satisfactorily in the face of prevalent medico-legal viewpoints, so that it may be of interest to physicians in general practice, and to medical students, as well as to those whose work is confined more specifically to personality disorders. These people called psychopaths naturally present a problem which must be better understood by lawyers, social workers, school teachers and by the general public, if any satisfactory way of dealing with them is to be worked out. It is the opinion of the author that before this understanding can come, "the general body of physicians to whom the laity turn for advice must themselves have a clear picture of the situation. Much of the difficulty which mental institutions have in their relations with the psychopath springs from a lack of awareness in the public that he exists. The law in its practical application provides no means whereby the community can protect itself from such people. And no satisfactory facilities can be found for their treatment". It is with these thoughts especially in mind that the author has sought to present the material of this work in such a manner that the average physician who treats few frankly psychotic patients might see that the subject lay in his own field scarcely less than in the field of psychiatry. After all, the author says, "psychiatry, though still a speciality, can no longer be regarded as circumscribed within the general scope of medicine". The author therefore considers that some modifications in medico-legal attitudes are imperative: (1) The patient's actual performance should be given consideration equal to that given to his rationality by verbal and theoretical tests; (2) it should be granted that there are degrees of competency and legal responsibility instead of continuing on the present rather large assumption that this is a sharp either/or question, that the patient must be called totally sane or totally irresponsible; (3) when anti-social acts are carried out by persons who show the easily recognised disorder, now classified with other conditions as psychopathic personality, they should not be sentenced to various arbitrary and limited terms of imprisonment; and (4) legal facilities for placing the psychopath under medical care and supervision should be established, not only for those whose felonous acts constitute a great menace to the community but also for those whose persistent incompetency is obvious in other ways. We hope that the frank and detailed discussion made by the author in this notable book will, at least, draw the attention of all concerned to the magnitude of the problem. The Mosby touch stands outstanding in the printing and get-up of this book.

CORRESPONDENCE

To The Editors, THE ANTISEPTIC, Madras.

Eversion of Flap after Cataract Operation

Sirs,

Under this head in "Cases and Comments" section of the December Number of the ANTISEPTIC appears a short case note on page 972. Here it is stated that in a case after cataract extraction the conjunctival flap completely everted as a result of the patient sneezing continually on the night following the operation. It is also stated that this accident is rare.

I wish to point out that this accident is not so rare as one imagines but is in my experience quite as common as an inverted flap, corneal or conjunctival, both occurring from the same causes mentioned by the author of the Case Note i.e., coughing, sneezing, restless winking under the bandage.

In such cases my practice has been, where it is possible, to foresee the incident before operation to abolish the cough reflex by an injection of morphine and atropine and to treat the nose or nostrils with packs of adrenaline 1/1000 and cocaine 4% (a few drops each). This treatment can be given if the incident arises suddenly after operation. Incidentally the sneezing is very often effectively prevented by squeezing the nose hard two or three times whenever there is an attempt to sneeze.

The inversion or eversion if slight (turned section), it is best reposed with a repositor and after A_4 the eye is tightly bandaged for 2 or 3 days, barring the occasions when the eyes are opened for A_4 instillation. Some cases present an elevated section only but no turning; these are handled in the same manner.

In case of obvious inversion or eversion, after reposing the flaps a single suture is applied, as stated in the case note, to anchor the lower lip with the upper lip of the section, but the best way to handle such cases is to prevent such accidents by carrying out a simple procedure in one of the following three ways:

1. When the operation is over, and where a conjunctival flap has been taken out, suture the lower to the upper lip by a single silk suture as the last step before bandaging the

eye ; where a bridge flap has been taken out the step is not called for.

2. In addition or instead of the above procedure, one brings the centre of the upper lid margin to that of the lower lid by a single suture, the free ends of the thread not being cut close but left loose for a few inches and then cut. This is to help cutting or releasing the suture easily on opening the eye on the 2nd or 3rd day, when one gently pulls on the free ends and then cuts the knot with fine scissors, *Or*, one passes a silk thread through the skin in the centre of the upper lid margin and ties a knot ; the free ends are not cut but brought down a little firmly on the malar prominence of the same side and anchored on the same by one or two pieces of sticking plaster.

These procedures prevent harmful working and exert some pressure on the section and prevent in many cases the accidents mentioned in the case note.

I have not seen after such accident any loss of vitreous but only a vitreous bulge in a few cases.

In the pre-penicillin days, after the best treatment of such cases, the results in respect of vision were poor, the eye being, in the large majority of cases, destroyed by a plastic iridocyclitis, but a smaller number of cases did get some vision and a case here and there was none the worse for the accident. But after penicillin therapy a distinct improvement is noticeable. This treatment I carry out as follows : The patient gets as soon as the accident is noticed 4 to 6 lakhs of penicillin per day intramuscularly in 2 or 3 doses of hourly instillation of penicillin solution into the eye, the strength being 10000 units to the c.c. of distilled water.

Yours faithfully,

Ambi House,
79 & 80,
Lingappa St,
Kancheepuram.
16-12-'50.

Capt. A. CHANDRAMOWLI,
L.M.S, B.Sc., L.O,
Physician and Eye Surgeon.

To The Editors, THE ANTISEPTIC, Madras.

An Interesting Case of Primary Peritoneal Pregnancy

Ref. :—Page 975, Dec. 1950 issue.

Dear Sirs,

There are cases on record of peritoneal pregnancy. The accepted theory is that these are cases of tubal pregnancy at the fimbriated end of Fallopian tubes which gradually extend into the abdomen.

In 1934 when I was a House-Surgeon in Patna Hospital for Women an interesting case was detected by us and reported by the then Professor, Dr. A. N. Sarkar, M.B.C.O.G. in *British Journal of Obstetrics and Gynaecology*. The history of the case was interesting. A lady came with a history of 14 months' pregnancy. She said that at the eighth month she had all the symptoms associated with labour but only a little vaginal discharge of blood. Afterwards the size of the abdomen started to get smaller and smaller.

I was referred to the case by the junior staff as he could not make out anything. On examination I found the uterus normal in size—the tubes and ovary normal and a tumour in the abdominal cavity. Per abdomen I could make out the head and 2 limbs. There was difference of opinion. The majority were of opinion that it was a case of dermoid cyst. X-ray came in my favour.

On operation.—A mummified child was found. The placenta, sac all adherent to the omentum, gut and neighbouring viscera.

In this particular case the author says that the uterus was of the size of a cocoanut—why? Was there any blood clot or anything ?

Secondly, he has not mentioned whether on P.V. examination the size of the uterus could be made out or not ?

Thirdly, how could he detect unruptured membranes per vaginum ?

Fourthly, abdominally, could he not differentiate between 2 tumours (one the enlarged uterus and the second the fœtus) ?

I have not become a general practitioner and have forgotten many things and hence the author will excuse me for the questions asked which are all due to curiosity.

Kadamkuan,
Patna-3.
15-1-'51.

Yours faithfully,
S. SAMADDAR.

NEWS AND NOTES

All-India Conference on Dermatology and Venereology

The Hony General Secretary writes :

An All-India Conference on Dermatology and Venereology will be held at Calcutta on Saturday, the 14th April and Sunday, the 15th April, 1951, under the presidency of Dr. A. C. Rebello of Bombay.

Papers of scientific and clinical interest will be read. Demonstrations (clinical, microscopic etc.) will be arranged. The Committee would be most grateful for any suggestion and would welcome any request. Prior intimations from the delegates will be much appreciated by the organisers. We appeal to the members of the profession for papers and contributions for the Conference. Such contributions, or at least an abstract of the same, should reach the Secretary before the 15th of March, 1951, for their inclusion in the Programme.

All communications should be sent to the Secretary at 15, Camac Street, Calcutta-16, Telephone Number—Park 1540.

Blood Plasma from Seaweed.—British scientists have evolved a method of producing blood plasma from a seaweed. The only known sample in the world of this unique new chemical is now at the Seaweed Research Institute in Scotland.

This substance for blood plasma has been named "Laminarin" and is a type of seaweed starch. One ton is produced from about 100 tons of seaweed. The amount of dried seaweed which can be gathered from the Scottish coasts each year is not far short of 200,000 tons.—L.P.S.

* * *

Simplifying Cardiac Diagnosis.—An instrument which makes a completely new contribution to the field of electro-medical science and provides the most modern aid for immediate diagnosis of cardiac conditions has been produced by a London firm. Designed in the shape of a suit case, it can be used in the consulting room, the hospital, or the private home.

The instrument, in which the heart impulses are amplified by an electronic valve, actuates a unit which records permanently and directly on to special sensitivised paper. This enables the instrument to be small and light—its weight is only 50 lbs. It is fully tropicalised and operates from 50-cycle alternating current mains of either 100/125 or 200/250 volts.—B.I.S.

* * *

"Atomic Age" Wing for Manchester Hospital.—"Manchester's First Atomic Age Building" is the description given to an extension to Christie Hospital which has just been opened.

This extension is fully safeguarded against the gamma rays of radio-active isotopes and X-rays given off by radium. The scope of the hospital's treatment centre will be doubled by the new block, which includes a pathological laboratory, office accommodation and treatment rooms for X-ray therapy.

Solid concrete walls 2½' thick, brick walls covered with ray-proof barium plaster and control cubicles with lead insulated walls will protect the staff and patients from the gas dealing rays which have been harnessed for healing. A Manchester-built 300,000 V. deep therapy machine operated by remote control and a radium "bomb" for deep treatment of malignant growths will be used in the new building.—B.I.S.

* * *

India Honours Discoverer of Penicillin.—The world looks upon Sir Alexander Fleming as a brilliant scientist. To-day, at 70, this white-haired, soft-spoken man—known the world over as the discoverer of the wonder drug penicillin—is the Emeritus Professor of Bacteriology in the University of London. India has honoured him by just electing him an Honorary Fellow of the National Institute of Sciences of India.

Inheriting a small legacy at the age of 20 when he was an office boy in the city, he invested it in a medical education. After a brilliant academic career, winning all prizes and medals, he began to work in the Inoculation Department of St. Mary's Hospital under Sir Almroth Wright, the founder of vaccine therapy and went with him to France during World War I, where they established a Research Laboratory in Boulogne Casino. It was this research team that introduced the use of the saline treatment of war wounds. After the war, he returned to St. Mary's and became Assistant Director of the Inoculation Department. In 1919 he was also Hunterian Professor at the Royal College of Surgeons. In the same year he became Professor of Bacteriology in the University of London at St. Mary's Hospital. He was appointed Director of the Hospital's Department of Systematic Bacteriology, and since 1948 he has been Emeritus Professor of Bacteriology in the University of London.

Fleming's interest in antibiotics continued in the years that followed World War I. His further study of antiseptics and leucocytes led to a demonstration of the destructive action of antiseptics on the leucocytes in 1924. A recognised authority on vaccine treatment and antiseptics, he contributed to the research which established the value of M. & B. 693.

In 1928 came the great discovery for which all these years of anti-bacterial research provided the back-ground. When investigating the staphylococcus, Prof. Fleming noticed a growth of mould on one of his culture plates, which seemed to be dissolving the germs round it. He was "sufficiently interested" to investigate the mould—and discovered penicillin, a substance poisonous to microbes but not to the human body. Howard Florey, the famous biochemist, began a series of experiments which transformed the green mould into a miracle of healing.

Many honours came to the discoverer of penicillin during World War II. He was elected F.R.S. in 1943, was made an Honorary Member of the New York Academy of Science and in December of the same year received the annual award of the American Pharmaceutical Manufacturers' Association. He was knighted in 1944, elected F.R.C.P. in the same year and received many other distinctions. Created Nobel Laureate in Medicine in 1945, he presided over the Inter-American Medical Congress at Rio de Janeiro in September 1945. India has honoured herself by honouring this benefactor of mankind.

* * *

New Machine Aids Heart Operation.—A glass machine that can perform the functions of a patient's heart and lungs during an operation has been developed at Antioch College in the United States. The new machine weighs less than four pounds. It uses electro-magnetic gas valves to control the alternating pressure and suction that duplicate the hearts' pumping.—*U.S.I.S.*

* * *

Lowest Death Rate.—The death rate in the United States during 1950 was 9·6 per 1000 persons, according to the Metropolitan Life Insurance Company. This was the lowest level on record and represented a decline of one per cent from the 1949 rate.—*U.S.I.S.*

Multitest Clinic Speeds Detection of Disease in U.S.—The multitest clinic, a new approach to disease hunting, is being developed in the United States in an effort to control such diseases as tuberculosis, cancer, diabetes and heart disease. U. S. physicians believe that 75 per cent of chronic-disease cases can be treated successfully and often the patient cured—if the disease is discovered soon enough. The multitest clinic, which can examine a person for nine or more diseases in about 30 minutes, is a step toward early detection.

One of the first successful public multitest clinics in the United States was operated at Richmond, Virginia, during 1950. Its staff of medical technicians, supervised by physicians, examined some 38,000 Richmond citizens over 15 years ago. All tests were free.

A patient registered and gave an attendant a brief medical history. He was X-rayed for tuberculosis, his blood pressure was recorded and a sample of his blood was examined for syphilis. Some persons were given vision tests and examined for glaucoma—a major cause of blindness for adults. Results of all tests were forwarded to the person's own doctor, who revealed the findings to his patient. The Richmond multitest clinic was a co-operative project of the U.S. Public Health Service, the State and City Health Departments, the City Tuberculosis and Heart Associations, and the Richmond Red Cross Chapter.

Heretofore, most public health clinics were specialised, trying to find only one disease. To be examined for several diseases a person had to make appointments at a number of clinics and spend hours in different examining rooms.—*U.S.I.S.*

* * *

Quick Food Inspection.—A new X-ray unit developed by the United States Army inspects canned foods for impurities while the cans are in the packing cases. The inspection method uses fluoroscopic techniques to reveal damaged or deformed cans. It also indicates the degree of deterioration of the contents, as well as corrosion, foreign matter inside the cans and other defects.

An automatic conveyor belt carries entire cartons of canned food before the X-ray apparatus. Mechanical controls turn each carton to permit it to be viewed from all angles. Cartons containing defective cans are marked and when they reach the end of the conveyor system are separated from the other cartons.—*U.S.I.S.*

* * *

Penicillin Factory for India.—The World's Health Organisation and the U. N. International Children's Emergency Fund have offered to assist India in setting up her first Penicillin Factory in Bombay. UNICEF will provide 850,000 dollars worth of apparatus from the United States. The WHO has offered a grant of 350,000 dollars to pay for the technical experts needed in the factory.—*New York Journal of Commerce.*

* * *

T. B. Experts for India.—Eighteen tuberculosis experts from overseas have arrived in New Delhi for setting up T.B. demonstration and training centres in India and Pakistan by the WHO and UNICEF. This international personnel has been recruited by the WHO for the tuberculosis demonstration and training centres shortly to be opened by the Governments of India and Pakistan in Delhi and Trivandrum and Karachi respectively. The UNICEF is providing laboratory equipments, essential supplies and mobile X-ray plants for the centres, apart from bearing the cost of the international personnel. No date has been fixed for the formal opening of the centres in Delhi and Trivandrum. The Delhi and Trivandrum centres are the first of six which it is planned to open in different parts of S.E. Asia with assistance from WHO and UNICEF. The other four will be in Patna, Colombo, Rangoon and Bangkok. The object is to provide each country of the region one or more model centres equipped on modern lines where international personnel will demonstrate modern methods of tuberculosis control and will train parallel local teams, give post-graduate instruction to individual specialists, train individual nurses and technicians and give refresher courses to general practitioners.

* * *

Arterial Blood Transfusions.—American doctors have developed a new technique for rapidly transfusing blood through the arteries. This treatment is used when patients in critical states of shock or heavy bleeding fail to respond to ordinary transfusions through the veins.

The new method permits a faster flow of blood under great pressure because the arteries carry the blood away from the heart. Veins carry blood to the heart and, therefore, venous transfusions must be slower to avoid heart attack.

With an arterial transfusion a pint of blood can be administered in four minutes, and as many as 20 pints have been given to a patient. Ordinarily a venous transfusion of a pint of blood takes from half an hour to three hours.

Persons suffering from shock or haemorrhage have a reduced blood pressure. Blood administered through the arteries gives the heart something to pump on and build up pressure so that the patient's normal blood pressure is maintained no matter how much blood is lost. Pressure in the transfusion apparatus is maintained by a pump or by raising the bottle containing the blood to be administered about six feet above the level of the heart. Dr. Sam F. Seeley of Walter Road Hospital in Washington who explained this new method says that it can be used with plasma, the clear liquid portion of blood, as well as with whole blood. Research is now under way to determine whether the technique can be used on cases of thrombosis or clotting in the blood vessels.—*U.S.I.S.*

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